

Minutes of 24th Annual Meeting of the Working Group on Co-operation Between European Forecasters (WGCEF)

By Christian Csekits, ZAMG (chair) and Jos Diepeveen KNMI (vice-chair)

Monday 12th – Tuesday 13th of November 2018
BY14 Hotel in Tel Aviv

List of Participants

Surname	First name	Organisation
BLAAUBOER	Dick	Eumetnet
BRAININ	Evgeny	Israel Meteorological Service
CSEKITS	Christian	ZAMG/Austria
CUSACK	Evelyn	Met Éireann/Ireland
DAVIDOFF	Oren	Israel Meteorological Service
DIEPEVEEN	Jos	KNMI/The Netherlands
HEWSON	Tim	ECMWF
HOIKKANEN	Marjo	FMI/Finland
JAMESON	Stephanie	UK Met Office/Great Britain
LETESTU	Andre-Charles	MeteoSwiss/Switzerland
KALIN	Lovro	DHMZ/Meteorological and Hydrometeorological Service of Croatia
LAINÉ	Mikko	FMI/Finland
PALJAK	Taimi	Estonian Weather Service
PATERSON	Laura	UK Met Office/Great Britain
PATKAI	Zsolt	OMSZ/Hungary
RAZY	Alissa	Israel Meteorological Service
REY	Jaime	AEMET/Spain
ROULET	Bernard	Meteo-France
SANDEV	Marjan	Czech Hydrometeorological Institute
SAVIR	Amit	Israel Meteorological Service
SKELBAEK	Michael	DMI/Denmark
STAV	Nir	Director of Israel Meteorological Service
TROISI	Antonio	Italian Meteorological Service
VANHAMEL	Thomas	RMI/Belgium

Monday, 12th of November

Session I 'Introduction':

* Welcome Address Director of IMS Nir Stav

Nir Stav tells us about the history of IMS and the important role of Ben Gurion for establishing the weather service, particularly aviation forecasting. Nowadays IMS is active in a wide range of sectors.

* Opening words (Christian, Jos)

* Welcome of the new WGCEF members (Jos and Christian)

* Agree agenda and review actions from last meeting (Jos and Christian)

Session II 'Updates since the last meeting':

* Round table: participants introduce themselves and giving update on new developments within their NMSs (5 minutes each)

Cristian Csekits/ZAMG

- ZAMG participating in ARISTOTLE II Project, which is delivering multi-hazard information to the ERCC (Emergency Response Coordination Centre); Start: November 2018
- INCA: forecast data from AROME (instead of ALARO) from end of 2018 on
- New thunderstorm guidance bulletin for internal users (maybe presentation for 2019)
- Projected restructuring of one shift (more international weather forecasts or more activities on social media; more details in 2019)

Evelyn Cusack (MET ÉIREANN)

- 12 members Ensemble high-resolution (2.5km) has become operational. Model is 54 hour and ensembles are 36 hour.
- We are hiring 8 meteorologists put on panel in July but no one has arrived yet!
- We are setting up a Flood Forecasting Center. Hiring 6 hydromets (3 so far).
- Monthly forecaster/NWP'ers meeting....very useful. Sometimes lively. Older forecasters resting ensembles! (ECMWF course in February)

Jos Diepeveen (KNMI)

- Major KNMI project: development of a new web-based Met. Work Station: Geoweb. Also other European NMS's are interested.

- KNMI got this year extra funding from the ministry to keep basic services on a proper level, with possibility for development to an Early Warning System. However, budget-planning for 2019 is still difficult.
- On the 8th of March on international women's day we had a complete female operational shift:

Tim Hewson (ECMWF)

- New seasonal forecast system SEAS5 went live in Nov 2017
 - Higher resolution (32km from 80km, ocean 0.25° from 1° , sea ice model)
 - More recent reference period for anomalies, to help address non-stationarity (climate change) issues +...
- New Model cycle 45r1 went live in Jun 2018
 - Improved physics, better rainfall near coasts in “warm rain” situations
 - Lightning flash density forecasts included
 - HRES now coupled to ocean, so SST changes according to overlying weather +...
- Migration work for the relocation of the next ECMWF supercomputer in Bologna is gathering pace...
- New Web-based Forecast User Guide released in May 2018 – unrestricted access ☺
- ENS and HRES Vertical Profiles are now available in ecCharts
- “Weather Cloud” initiative started.

Robert Hausen (DWD)

- Issue of warnings for W-Germany switched from Offenbach to regional office in Essen regional expertise under controlling/guidance of supervisor/lead forecaster in Offenbach now for entire Germany.
- Fusion of aviation and general weather forecasting in Essen, prove of similar concepts for Berlin and Munich
- More focus on international activities and issue of user-orientated products (focus on severe weather events) in forecasting headquarter in Offenbach
- ICON-EPS is operational since beginning of 2018 (after successful period of evaluation)

Veronika Hladnik (EARS)

- New web page www.vreme.si with hourly forecast which is nice for use for smart phones
- Internal roject for new subjective products for special groups of users in progress
- Small group starting to produce audio and/or video recordings

Lovro Kalin (DHMZ)

- Staff level improved (several young forecasters fully employed, some still on apprentice), age structure changed – generation shift
- Still infrastructural problems (operational room, inadequate facilities)
 - refurbishment needed, new building expected in 2022
- IBL VW visualisation in full operational, forecast production in progress, expected fully in Spring 2019
 - new products (tailored, automated end products, tailored diagnostic/forecasting parameters)
- Warnings improvement (more elements, cold waves introduced this winter, demand for County based warnings, automatization, impact based, thresholds improvements...)
- New web page *meteo.hr*
- Forecasters communicate via Slack, other social networks still wait

Mikko Laine (FMI)

- Regular, twice a month, verification meetings between meteorologists, model developers and post-processing method developers. Also we have nominated one meteorologist to work as contact person between model developers and forecasters. In addition some of our forecasters are more engaged with the post-processing method development. In both cases above worktime is shared between development and forecasting units.
- We have integrated crowdsourcing app to our weather app. We are collecting weather observations from citizens (e.g. precipitation, ice thickness, snow depth, hail, slippery pedestrian weather). Meteorologists can monitor these observations directly from our meteorological workstation (SmartMet).
- Tailored products for our customers: weather chat, Webex briefings (virtual meeting) e.g. for ice breakers & pilots and electricity companies.
- We have increased our activity in social media. We have reorganised our shifts to get more time for social media tasks: regular tweets in Twitter, weather related videos in YouTube. We can also create weather videos directly from our workstation.
- The aviation weather unit has launched a tool developed in FMI to ease the production of Significant Weather Charts together with SMHI in Sweden
- We have started to use Slack as in-house chat and team message platform. Aviation unit is using Slack to communicate (SWC, Sigmets) with other Scandinavian and Baltic aviation units
- Since last autumn, aviation forecasters have been participating weather meetings in Helsinki Airport operations center together with airport stakeholders to help plan actions to mitigate the effects of high-impact snowfalls and thunderstorms.
- The FMI is participating the ARISTOTLE (All Risk Integrated System TOwards Trans-boundary hoListic Early-warning) Project, which is delivering multi-hazard information to the ERCC (Emergency

Response Coordination Centre). As a backup leader of weather hazard group after UKMO, we are also leading the group ten weeks per year.

- The FMI is leading PECASUS (Pan-European Consortium for Aviation Space weather User Services) consortium, which is aiming to provide information on space weather that has the potential to affect communications, navigation and health of passengers and crew.
- We are starting to collect a database of impacts of severe weather events to further increase the accuracy of impact based warnings.

Andre Charles Letestu (Meteoswiss)

- A new law has been approved by Parliament, which applies from the 1st January 2019, One of the main aims is to strongly reduce the price of observed and forecast data.
- The number of products include probabilities, especially on the web site and in the App, a new project has been launched aimed at developing a concept to communicate probabilistic forecast to the public.
- MeteoSwiss has published documents about climatic scenarios in Switzerland (CH2018) and their resulting probable effects on tourism, economy, agriculture, civil protection and welfare; events have been organized in various locations in Switzerland. Several products are currently elaborated manually. It is planned to produce them automatically using data4web which is a forecast data base computed using model data, and input from the forecaster.
- A MeteoSwiss twitter channel will be launched on the 1st March. There will be one for each language. At least one tweet a day should be sent.
- Continuous snow measurement (every 10 minutes) will soon be available on the MeteoSwiss automatic measurement network. A test is currently in progress at Geneva airport.
- Two projects concerning the future of COSMO models have started or about to start. ModInterim began early 2018 and will finished late 2020. The goal is to produce an ensemble model from the analysis to 5 days with a horizontal resolution increasing seamlessly from 1.1 to 2.2 km. New observations will be added in the assimilation and a new scheme (KENDA) will be applied. The second project, called ICON-22 will start mid-2019 and will finish late 2022. It will replace the COSMO models by a new version calculated on an icosahedral grid developed by the DWD.
- A post processing project (PostprocVeri) has just started, its aim is to the establishment of a probabilistic and spatial postprocessing for several parameters on all weather prediction time scales taking into account all available observations and models, automatic and seamless in time.

Taimi Paljak (EMHI)

- The meteorological and hydrological Network is automated. Additionally there are manual observations only in 3 stations

- Close cooperation with civil protection authorities (thresholds of warnings, further development of service)
- Development of HARMONIE with resolution 2.5 km
- Development of road model
- Use on SENTINEL data for ice chart on the platform QGIS
- Meteorological Workstation SMARTMET implementation in framework CESAR project

Laura UKMO

- New CE, Prof Penelope Endersby and Chair, Rob Woodward, appointed.
- Large scale transformation and Efficiency project underway
 - Large scale infrastructure updates
 - Programme of voluntary redundancies
- What this means for forecasting – Making operational work more efficient, developing tools to cope with future NWP, object/event approach, ways of working, reducing unsociable hours, improved visualisation.
- Meanwhile, resourcing challenges.
- Science changes – recent PS41, MOGREPS UK hourly cycling being trailed.
- Climate updates – WSSP China, ARRCC Programme with Dfid, IPCC contributions, CSSP Brazil
- Contract changes – roads, Heathrow, M&S, Gatwick, new Beta Website.

Amit Savir (IMS)

- Automatic weather station on one ship
- AMDAR data: start in December 2018 (EI-AI carrier)
- New website in early 2019 (in Hebrew, Arabic and English language)

Zsolt (OMSZ)

- This May a country-wide hail protection system has been started.
 - HMS offers special meteorological forecasts: hail probability maps. (0-30%: yellow, 30-60%:orange, >60%: red).
 - 5 new colleagues were hired for this task.
 - Hail protection period: 1. May - 30. September.
- In September new task started: Social-media
 - Working hours: 8-18 h.
 - Responsibilities:
 - Making a weather forecast video on YouTube (every day). All the graphics and images are made with our visualisation system. Flexible: one may decide which / how many / what type graphics he/she use

- Posting weather information on HMS Facebook. Both domestic and worldwide weather news
 - Replying Facebook messages related to forecast
 - Serving TV channels who wants to make a reportage on weather
- After 10 years about 30% payment raising is expected next year.
 - Reduction of staff in 2019? It was unsure at the moment of creating this slide.

Vida (LHMS)

- Reorganization (reduction of staff and full automatization of meteorological stations) since 2018-03-20. The best specialists did not leave the LHMS, fortunately. They work in (were moved to) a newly created Research and Development department.
- As general weather, marine and hydro forecasters were joined into one unit, so in 2018 we learn:
 - to work together (physically in one room and adjusting new areas of job)
 - to use reduced amount of information about weather phenomenon (no observers in meteostations, no volunteers institution).
- Reduction of staff leads to less possibilities of external training, especially using classroom faze.
- Weather and hidro forecasters are unused to a lot of regulations (bureaucratic problems) associated with aeronautical weather services.
- No new forecasting methods or tools were introduced, just videoconferences between remote units. Introduction of videoconferences with main customers (Fire and Rescue Department, Command and Coordination board, Situation coordination division).

Jaime (AEMET)

- CAP 1.2 became operational on 18th of June 2018 at national level, but due to visualization problems it is still not visible in Meteoalarm.
- Storm Naming season 1 was a success. Season 2 just started with “Adrian”, named by Météo-France.
- Two important meetings related to forecasting held in last couple of months:
 - 6th National Symposium on Forecasting. 17 – 19 September
 - HARMONIE-Users Workshop. 6 – 7 November

Bernard (MF)

- Climatology

- All databases migrated from ORACLE to PostgreSQL
- Implementation of a management tool for climate archives

- Observations
- New radar mosaic SERVVAL : all software treatments available at T+2mn
- New radar band C Doppler double polarisation at Ajaccio/ Alata, 780 m western coast of Corsica

- Forecast
- Models :
 - AROME overseas (Lesser Antilles, La Reunion-Indian Ocean, New-Caledonia and Polynesia-Pacific Ocean) could be extended up to 72 hours
 - Ensemble assimilation implemented in AROME and PE AROME
 - Developments for coupling AROME and ocean model
- Production
 - Work in progress to build an automatic production line of fields from D to D+14 under probabilistic form
- Vigilance
- Vigilance : 2 red events
 - Snow 28/02/18 Hérault
 - Heavy rainfall 15/10/18
- Work in progress for impact base rain-flooding vigilance (working group Regional Forecasters-Hydrologists)

- Vigilance
- Developments start on new software to allow vigilance on smaller area (infra-departmental)
- Super Computer
- Renewal process initiated : answers from manufacturers expected until March 2019
- Expected target is a 5 multiplication factor but perhaps only 4
- Implementation target : before the end of 2020

Marjan (CHMI)

- New application Alert Editor for issuing of meteorological, hydrological and air pollution warnings (within software Visual Weather f. IBL soft)
- New warning web pages
- Changes at distribution warnings - CAP to FRS CR
- Mobil application (Android, IOS)
- Media department for the whole CHMI (from September 2018)
- Put into one roof social networks (facebook, twitter, you tube)
- A new concept of employee training is being developed within the CHMI, the MOODLE system will be the main tool for education
- A new supercomputer for model Aladin, from February 2019 with horizontal resolutions of 2,4 km

- Continuation in project „Prevention of security risks caused by extreme meteorological phenomena - their specification and innovation of forecasting and warning systems with respect to climate change“
- After six years of preparation, a new Central Forecasting Office will be built (from December 2018).

Michael (DMI)

- Extra budget funds
- Model shift & and new models
- New staff, app & homepage
- Twitter Award
- We are moving!

Thomas (RMIB)

New products and developments:

- Road forecasting model implemented (operational test phase this winter, operational forecasting next year)
- Automatization of warning verification (development phase)
- “forecast database”: forecasters chose “model of the day” that feed all our outgoing products (development phase)
- Astronomical product (short term forecast of clouds: structure, type, total amount; transparency of the atmosphere; “seeing-index” based on turbulence) (development phase)
- Cooperation with regional hydrological agencies (drought index, QPE and other radar/precipitation products) (semi-operational phase)

General news concerning the weather office

- Space weather formations held
- New head of department: David Dehenauw replaces Fabian Debal
- Open door days held in September 2018

Session II ‘Updates since the last meeting’:

- * Discussion of the 23rd WGCEF Newsletter (Bernard)
- * WGCEF website and social media report (Andre-Charles)

- **EUMETNET Update (Dick)**

Dick gives us an interesting overview of all EUMETNET activities. Details can be viewed in his presentation.

- **EUMETNET Task Team on Storm-Naming Update (Evelyn)**

The west-group and southwest group in storm naming have made quite a lot of progress last year. The two regions are cooperating more and more.

-There is need for structure:

-Coordination of storm naming within an (internet) platform (Meteo alarm): Such a platform with a shared understanding of which low has been named could take away a lot of administrative task for the forecaster.

Concerning the issues with the University of Berlin, their statement is that they don't want to cooperate with the EUMETNET initiative according to Evelyn.

Tuesday, 13th of November

- **15:15 - 16:15 Session III 'Presentations: Social Media' (20 minutes each including discussion):**

Michael Skelbaek: "Changing forecaster role and communication to the public"

In Denmark we see a growing need for the forecaster to communicate about the weather to the society and emergency management rather than "just" making a text forecast. Through a lot of training our forecasters are ready to make small video clips, tweets and in general being on medias. The forecasters did actually win a special language prize for the best tweets in Denmark 2018! To the professional user our main focus is to communicate uncertainties and nowcasting and to tell about the impacts. Besides that we have done some actions to make our met office more resilient to the future. Every forecaster is now capable of doing aviation forecasts which is important due to the growing cooperation between the Nordic countries and the Baltic countries in NAMCON.

Jaime Rey: "The use of social media for warning dissemination in Spain"

Weather warnings in Spain, produced with web software, are disseminated through a data processing unit and a warning database. The use of a message broker software enables the dissemination of automatic messages in social networks. Aemet publishes in a Blog, Youtube and Facebook on a regular basis, but Twitter is currently the leading Social Network, with more than 175.000 subscribers.

The impact in social networks of the first Storm Naming season for the SW group was studied. By analysing the total number of visits to Aemet's web page and the impact of Tweets with the hashtag #BorrascaName we concluded that Storm Naming helps with the spreading of the severe event and their associated warnings through mass media.

Stephanie Jameson: "Met Office: The use of social media: Communicating Meteorological Information to the public"

This presentation looks briefly at how we have developed our current approach to using social media to communicate weather information to the public.

In 2015, we, at the Met Office, set-up our own in-house operational media team which enabled us to move to a 24/7 Twitter platform, expand further into Facebook and also create accounts on Instagram and Snapchat, amongst other channels. We will describe how the media team work closely with other parts of the Office to determine the content we produce, as well as how we vary our approach depending on the channel being used and the demographic of that channel's user.

Finally, we will look at how this has increased our public reach, before touching upon what we might anticipate for the future in terms of our use of social media.

Tim Hewson: "Recent and upcoming developments at ECMWF"

- New seasonal forecast system SEAS5 went live in Nov 2017
 - Higher resolution (32km from 80km, ocean 0.25° from 1° , sea ice model)
 - More recent reference period for anomalies, to help address non-stationarity (climate change) issues +...
- New Model cycle 45r1 went live in Jun 2018
 - Improved physics, better rainfall near coasts in "warm rain" situations
 - Lightning flash density forecasts included
 - HRES now coupled to ocean, so SST changes according to overlying weather

Alissa Razy: "Using Lidar ceilometer and its products for nowcasting"

For nowcasting Lidar information was very useful for nowcasting fog conditions for the Tel Aviv airport. Also lidar information is used for diagnose dust events and fire events.

Andres-Charles Letestu: "New products provided by MeteoSwiss for Geneva Airport"

For many years MeteoSwiss has provided support for aviation.

Recently collaboration has increased between itself, air traffic control (Skyguide), and the operation centre at Geneva airport. Past MeteoSwiss products have been rethought , and new ones created ,in order to best respond to the needs of the airport. Here are examples of some new and updated forecasts.

A thunderstorm forecast is sent to air traffic controllers to enable delays to be anticipated. Telephone contact with the controllers provides further with the forecaster if necessary.

The Dashboard; this consists of a platform on which radar, satellite, and forecasts of various meteorological parameters are displayed including the temperature and state of the runway. Probabilities of fog, thunderstorms or snow are added by the forecaster. The same product is displayed in both the operation centre at Geneva Airport (APOC),and in the forecasting room at MeteoSwiss.

The charter forecast enables APOC to predict delays due to weather hazards in departure airports, and on roads to ski resorts, during busy winter weekends.

Warnings of lightening, strong winds and snow are also issued for the Geneva Airport area.

Finally, since 2016, a low level significant weather chart over the Alps is produced every three hours in a collaboration between Austrocontrol and MeteoSwiss.

The two centres produce this chart simultaneously using the same tool.

Mikko Laine: “Forecast verification at FMI”

Constant forecast verification is a key to further improve our forecasts and our post processing methods.

Verification is a way to understand differences between models and a way to find best performing model in a current weather situation. A good way to find new model errors and to cope with known ones. Different operational units at FMI verify different things, e.g. aviation unit is interested in ceiling, visibility and low clouds. Safety Weather Services verify high wind speeds, and hit rate of weather warnings. At tailored weather services we verify temperature and precipitation forecasts.

We are using two verification tools at FMI, both are developed by FMI.

With "Verification Tool" we can do both daily verification and also monthly and yearly verification. We can verify different models, post-processing methods, and also weather data from our institute and from weather data from our neighboring national institutes. We can visualize data with tables, charts and maps.

With "Personal Trainer" our meteorologists can compare their own forecasts to average off all forecasts. We can visualize data with tables and charts.

"Personal Trainer" is still under development.

Bernard Roulet: "Severe snow event in Hérault on the 28th of February 2018"

Storm Ana produced an active snow event on the 28th of February 2018 on southeastern France especially over Hérault (department n°34). Forecast of models (ECMWF, ARPEGE and AROME) are studied from medium range to very short range and then compared to observations. Orange then red vigilance for snowfalls were issued by Météo France during this event. Despite these alerts, major troubles occurred near the town of Montpellier particularly on motorway A9. Attempt to explain and conclusion.

Thomas Vanhamel: "The 2018 drought in Belgium"

Drought is a creeping natural hazard that is not bound to specific climates. It can occur even in temperate maritime climates, like in Belgium. Climate models project an overall increase in precipitation in northern Europe and a decrease in southern Europe. Belgium, lying in the transition zone, could possibly see an increase in the occurrence of spring / summer droughts, similar to the ones that occurred in 2017 and 2018. Adaptation measures to cope with these persistent dry weather regimes must therefore be considered. A first step in adaptation is the monitoring of droughts. In this light, the Flemish regional government established in autumn 2017 a "drought committee" that gathers observations and indices concerning droughts, and decides on a drought state. This information is then used by decision makers, to decide whether measurements (restrictions) should be taken. The RMI is indirectly involved in this process, since it delivers several products to the Flemish hydrological service, i.e. SPI, radar products, ... In the light of global change, these kind of co-operations between meteorological services and other institutes could become increasingly important to tackle difficult problems that concerns the society in an interdisciplinary manner.

Christian Csekits: "Severe rain and storm event in Austria in October 2018"

The period from 27th to 30th of October 2018 was a very extreme one relating severe weather phenomena in Austria as well as in many other parts of Central Europe. First a persistent low over the Gulf of Genoa with a frontal system caused strong rainfall in the south-western parts of Austria. After a short break of 12 hours the next low developed over the Western Mediterranean Sea and propagated over Northern Italy and Switzerland to the Benelux States. This led to another period with heavy rain in the same area of the first rain event. Total precipitation up to 650 mm was observed within 72 hours, which is 2 to 3 times the monthly sum of precipitation for this region. Due to the strong pressure gradient severe wind gusts around 100 km/h in the valleys and up to 180 km/h in the mountains occurred. The performance of different models for various time steps is shown and the procedure of severe weather warnings issued by the Austrian Meteorological Service is illustrated.

Luckily the impacts on society and infrastructure were not that dramatic as suspected as a fact of the early delivery of red warnings and the excellent cooperation with the national emergency response center, army, police and fire brigade.

Antonio Triosi: Nightmare week in Italy end of October and beginning of November.

A typical upper air cut off low was giving high impact weather, especially because of a convergence line in the “warm sector” and a comma, associated to a PVA max behind the cold front.

During 3 November in Milicia there were 12 casualties because of severe flooding event. In total 32 casualties were counted, because of all kind of parameters.

Jos Diepeveen: Estimating storm impact using a storm number

At KNMI a way of ranking strong wind storms is being used, using an objective method by Sander Tijm: “The storm number.” Using this ranking, for the most severe storms (top 10) fact sheets have been made describing the impact on different user groups. These fact sheets can be used to estimate impact more objectively in case of a future severe storm situation.

Session IV ‘WGCEF Discussion Forum’:

* discussion on “training activities and sharing expertise”

-ESSL-testbed is recommended by a colleague from IMS. IMS is learning a lot from EU cooperation. They can bring in also unique knowledge, but have also some questions about synoptical phenomena, for example the “Red Sea Trough” Also their (operational database is recommended)

-UKMO also sends people to US but also has internal testbeds.

-IMS offers an exchange of expertise and wants to be involved in the European development

-Denmark is looking for a teacher in icing conditions.

-ECMWF e-learning modules: what’s the balance between on-line sessions, test-beds/hands on sessions/meetings or conferences. Combination of different methods is fine! Exchange of ideas and knowledge just by face to face meeting is most preferred but maybe not that practical.

- Training in Tropical Meteorology for ZAMG forecasters (Aristotle II)

Session VI 'Closure of the meeting':

The next WGCEF meeting will be in Dublin (26th and 27th of September 2019)

With thanks to Evelyn/Met Éireann in advance for their kind hospitality!

-Date to be decided, two days on Thursday and Friday in the end of September/beginning of October (yet decided: 26th and 27th of September 2019).

-2 complete days was received in a warm welcome.

Tips for next meeting/remarks

-Prepare the discussion with questions!

-Online participants are welcome to do presentations. We should bear in mind that technical problems are always possible if technically possible.

-Newsletter articles: you can always ask a colleague

-EMS sessions are recommended so send articles. Call for papers beginning of next year.

14th of November 2018, Jos Diepeveen and Christian Csekits