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Towards a new daily in-situ precipitation data set supporting parameterization of wet-deposition of CTBT relevant radionuclides

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As contribution to the World Climate Research Program (WCRP) and in support of the Global Climate Observing System (GCOS) of the World Meteorological Organization (WMO), the Deutscher Wetterdienst (DWD) operates the Global Precipitation Climatology Centre (GPCC). The GPCC re-analysis and near-real time monitoring products are recognized world-wide as the most reliable global data set on rain-gauge based (in-situ) precipitation measurements. The GPCC Monitoring Product (Schneider et al, 2011; Becker et al. 2012, Ziese et al, EGU2012-5442) is available two months after the fact based on the data gathered while listening to the GTS to fetch the SYNOP and CLIMAT messages. This product serves also the reference data to calibrate satellite based precipitation measurements yielding the Global Precipitation Climatology Project (GPCP) data set (Huffmann et al., 2009). The quickest GPCC product is the First Guess version of the GPCC Monitoring Product being available already 3-5 days after the month regarded.

Both, the GPCC and the GPCP products bear the capability to serve as data base for the computational light-weight post processing of the wet deposition impact on the radionuclide (RN) monitoring capability of the CTBT network (Wotawa et al., 2009) on the regional and global scale, respectively. This is of major importance any time, a reliable quantitative assessment of the source-receptor sensitivity is needed, e.g. for the analysis of isotopic ratios. Actually the wet deposition recognition is a prerequisite if ratios of particulate and noble gas measurements come into play. This is so far a quite unexplored field of investigation, but would alleviate the clearance of several apparently CTBT relevant detections, encountered in the past, as bogus and provide an assessment for the so far overestimation of the RN detection capability of the CTBT network.

Besides the climatological kind of wet deposition assessment for threshold monitoring purposes, there are also singular release events like the Fukushima accident that need to be classified as bogus by a properly working RN verification regime. For these kinds of events a higher temporal resolution of the precipitation data sets is needed. In course of the research project 'Global DAily Precipitation Analysis for the validation of medium-range CLImate Predictions (DAPACLIP) within the Framework Research Programme MiKlip (Mittelfristige Klimaprognose), funded by the German ministry for research (BMBF), a new quality controlled and globally gridded daily precipitation data set is built up, where GPCC will serve the land-surface compartment. The data set is primarily constructed to study decadal behaviour of the essential climate variable precipitation, but as a collateral benefit it will also serve RN verification regime needs. The Fukushima accident has also provided impetus to construct even hourly in-situ precipitation data sets as will be presented in the same session by Yatagai (2012). A comprehensive overview on available precipitation data sets based on in-situ (rain gauge), satellite measurements or the combination of both systems is available from the International Precipitation Working Group (IPWG) web pages (http://www.isac.cnr.it/∼ipwg/data/datasets.html).

References

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