

4th workshop on assimilating satellite cloud and precipitation observations for NWP



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Biases in all-sky data assimilation: ignore, screen, correct?

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This talk will give an overview of the cloudy and rainy biases our community have to face in order to assimilate all-sky satellite data successfully. Furthermore, we will discuss which different options have been explored or are in the pipeline to treat all-sky biases.

One option would be either to ignore or to screen the data in the presence of model bias. For example, at ECMWF the all-sky assimilation of microwave radiances revealed a lack of supercooled liquid water in cold-air outbreak regions over ocean, which explained a long-standing bias in the short wave net radiation. Using this data would degrade the forecast and while work is in progress to resolve this model bias, the affected microwave data is screened in the mean-time. Another option to tackle all-sky biases is using bias correction schemes. To our knowledge, most NWP centres do not use specific cloud or precipitation predictors for the all-sky assimilation. At the MetOffice, work is in progress in developing a selective VarBC for MHS channels 3, 4 and 5 where only a subset of radiances are chosen for bias correction, e.g. clear-sky only radiances. This is motivated by findings showing a bias for scenes affected by frozen cloud. A number of other centres and research groups also have to deal with biases and these strategies will also be covered. Which option in treating biases in the all-sky assimilation is best ultimately depends on the source of the bias and how the all-sky data is used inside the assimilation system.

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