Contribution ID: **29** Type: **Oral presentation**

Lightning modelling and assimilation

Tuesday, 4 February 2020 16:45 (25 minutes)

A lightning parametrization was developed at ECMWF, which became operational in June 2018. It can predict total lightning flash densities (cloud-to-ground plus cloud-to-cloud) both in the deterministic and the ensemble forecasting system. Its tangent-linear and adjoint versions were also developed and have been used over the past two years to investigate the possibility to assimilate lightning flash observations from the new GOES-16 Geostationary Lightning Mapper (GLM) using the 4D-Var approach. This presentation will describe the lightning parametrization, its validation as well as the first results from the assimilation of lightning observations in ECMWF's 4D-Var system. Issues that are specific to the assimilation of lightning data in a variational context will also be summarized.

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Session Classification: Session 2: Cloud and precipitation modelling

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