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In preparation for the operational assimilation of COSMIC-2 at NOAA, an extensive suite of experiments to quantitatively evaluate the impact of COSMIC-2 observations in global numerical weather prediction (NWP) was conducted. These studies confirmed that the statistics and impact of radio occultation observations in NWP skill had changed from the impact seen with missions such as of COSMIC-1, which was well documented in many peer-review publications over the last decade or so. These differences in impact are likely associated to changes in the data assimilation and forecast system that were not appropriately accounted for in the observation assimilation algorithm component. While work aiming at the optimization of the assimilation of COSMIC-2 observations at NOAA is ongoing effort, a set of quality control procedures and error characterization structures were developed, tested and implemented. The purpose of these changes was to enable early operational assimilation of COSMIC-2 into NOAA's global data assimilation and forecast system. Overall, current operational impact is still lower than the impact from COSMIC-2 that was estimated with observing system simulation experiments (OSSEs). There are several potential reasons for this discrepancy, ranging from steps and assumptions made with the simulation of the observations to differences in the model configuration. Regardless, a careful revisit of the RO assimilation algorithms is needed. During this presentation, results from these earlier investigations will be presented and lessons learned discussed. Finally, plans moving forward to improve the assimilation of RO observations at NOAA will be briefly outlined.

Presentation file

[cucurull-presentation.pdf](#)

Meeting name

8th International Radio Occultation Working Group Meeting - IROWG-8

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