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The first MetOp-SG Radio Occultation (RO) instrument prepared by RUAG for ESA will be launched in 2021 and is based on state of the art equipment that could be carefully specified thanks to a number of tools, datasets and Ensemble Data Assimilation (EDA) techniques that were jointly prepared by industrial teams, EUMETSAT and ECMWF.

Meanwhile, new commercial GNSS RO missions, which are typically based on miniaturized GNSS instruments, are coming up and will deliver medium quality measurements compared to those of MetOp-SG. Two questions raise in that respect: 1) what will the difference in Bending Angle be at high altitude. 2) what will the impact be in the lower troposphere, and what error contributions will come from medium-quality receivers and what contributions from the inverse algorithms. For this purpose, ESA just launched an activity with ECWMF and RUAG Sweden with the objective to quantify these errors with the environment developed for MetOp-SG and also to establish requirements for new highly miniaturized GNSS RO receivers in Europe that could be embarked on Cubesats or as part of the spacecraft platform GNSS receiver. These results will clearly be useful for the GNSS-RO community.

The MetOp-SG RO instrument is based on the Advanced GPS Galileo ASIC number 4 (AGGA-4). ESA is currently initiating another study to assess the feasibility and establish the requirements for the next generation (AGGA-5), which should more miniaturized than AGGA-4, and cover areas of interest like for example higher flexibility, higher integration with new microelectronics technologies, higher sensitivity and additional interference mitigation.

A summary of these ideas will be described in the paper, showing that ESA is active in the preparation of new RO instruments that complement MetOp-SG by providing a larger number of RO measurements with less costly GNSS instruments.
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