An Update from the International Radio Occultation Working Group Meeting 2016

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Overview

Motivation

- GRUAN-GSICS[1]-GNSS-RO[2](3G) workshop in Geneva [WMO, 2014]
  goals:

[1] Global Space-based Intercalibration System

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- Comparison of entirely independent measurement techniques can reveal biases and uncertainties in measurements/retrieval

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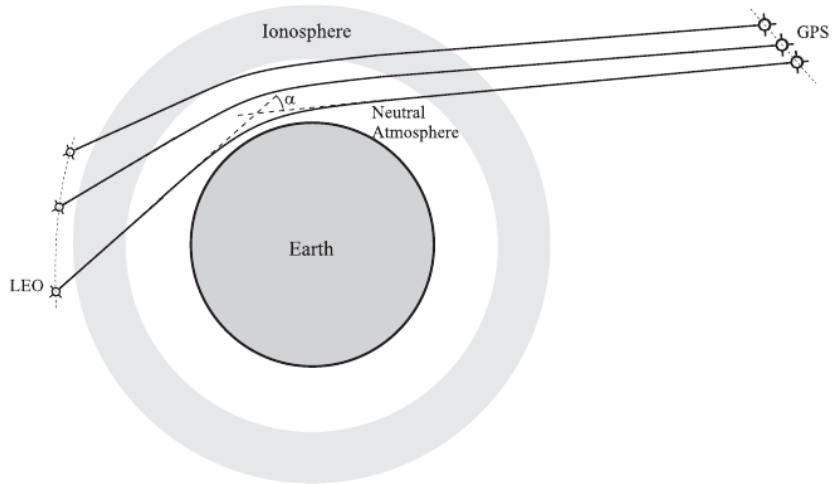
The Radio Occultation Method

- Signal transmitted by GNSS satellite (here GPS) is received by a low-earth orbit (LEO) satellite



Phase shift $\rightarrow$ bending angle $\rightarrow$ refractivity $\rightarrow$ (dry) temperature

Figure credit: [Syndergaard, 1999]

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- Comparing GRUAN and RO enables us to study the quality of RO retrievals and GRUAN bias corrections
- In a perfect world the measurements made with different techniques agree within their uncertainties
- RO technique offers the possibility to be SI traceable. A traceable uncertainty estimate on each datum is desirable

OPAC-IROWG Meeting 2016

OPAC - Occultations for Probing Atmosphere and Climate
IROWG - International Radio Occultation Working Group Meeting

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- I participated to represent the GRUAN community and gave the presentation
  'The GCOS Reference Upper-Air Network (GRUAN) and its Relevance to the Radio Occultation Community'
  [Tradowsky et al., 2016]

Focus of the OPAC-IROWG Meeting

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Members e.g.: Chi Ao, Andrea Steiner, Ben Santer, Johannes Nielsen, myself...

[3] Sustained and coordinated processing of Environmental Satellite data for Climate Monitoring

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The sub-group was working on recommendations for:

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3. Recommendations within IROWG
   - Develop RO as climate monitoring system (SCOPE-CM[3]), continue participation in wider scientific community

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- The choice of smoothing algorithm and climatology influences the retrieval at all levels
  $\rightarrow$ structural uncertainty

Uncertainty estimation in RO retrievals 2

- Comparison of retrievals from different processing centres used to estimate this structural uncertainty
  [Ho et al., 2012, Steiner et al., 2013]

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- Jacob Schwarz et al.: Integrating uncertainty propagation in GNSS radio occultation retrieval: From bending angle to dry-air atmospheric profiles [Schwarz et al., 2017]

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- I will present a GRUAN-RO comparison in a separate talk
- I am looking forward to represent GRUAN at the next IROWG meeting during September 2017
- Please keep me up to date about your projects involving GRUAN and RO

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Thank you for your attention!