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## SAR Imaging Geodesy— Recent Results for TerraSAR-X and for Sentinel-1

The Imaging Geodesy or Geodetic SAR technology exploits precise instrument metrology, wave propagation correction and dynamic Earth corrections following geodetic standards, e.g. solid Earth tides, to achieve an absolute pixel positioning accuracy comparable with GNSS [1]. The achievable accuracy is in the low centimeter range, depending on the SAR system resolution, its metrology products such as orbit position and timing, on the SAR processor accuracy and on the accuracy of atmospheric information describing the neutral and dispersive path delay contributions.

In the past the authors have demonstrated absolute positioning of corner reflectors with 5 cm accuracy in 3D space [2] and the positioning of natural points with a about 10 cm accuracy [3,5]. They have furthermore developed a pre-operational processor to add geodetic information to TerraSAR-X products [3]. An extension to other sensors is foreseen, especially Sentinel-1. Moreover, a large corner reflector (CR) array with more than 40 CRs distributed across some 150 by 150 kilometers has become available [4]. It is maintained by Geoscience Australia (GSA) and offers many possibilities in testing and verifying the said methods.

Current work is focused on using alternative reflectors than conventional corner reflectors, exploiting the lower resolution TOPS mode of Sentinel-1 and to seek for more applications of this new geodetic method [5], [6].

The talk summarizes recent developments, i.e.

- highly accurate TerraSAR-X geodetic measurements
- experiences with new, higher resolution ECMWF data to model the neutral atmosphere
- experiences with Sentinel-1 data on the team's and the GSA corner reflector networks and
- a study plan to extend the technology to Sentinel-1 data

## References:

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