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## Alternative Level 1A to 1B Processing of GRACE Follow-On LRI data

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The Laser Ranging Interferometer (LRI) on-board GRACE Follow-On, which was launched in May 2018, provides ranging data between two satellites with previously unknown precision. The low noise level of approximately 200 pm/rtHz at Fourier frequencies around 10 Hz allows us to investigate features, that have not been seen before in the ranging data.

Due to this high sensitivity of the LRI, we are able to assess spurious linear non-gravitational accelerations in direction of the line-of-sight caused by attitude thruster activation, which should ideally produce only angular motion. This analysis may help to refine the models used in the Calibrated Accelerometer Data (ACT) product. The ACT product is derived from raw accelerometer data and corrects artefacts present in the raw accelerometer (ACC) product. However, linear non-gravitational accelerations can only be measured in narrow frequency ranges by the LRI, where the gravity ranging signal decayed below other contributors.

The conversion of LRI Level-1A to 1B is a complex task that comprises non-trivial removal of phase jumps, scaling, filtering and interpolation of data. In order to access the high-quality ranging data and have low post-fit residuals, the LRI instrument team at the Albert-Einstein Institute (AEI) in Hanover, Germany derived an alternative LRI Level-1B data product for January 2019 with some improvements compared to the official SDS RL04 data. The data can be downloaded at <https://wolke7.aei.mpg.de/s/AYza4wrFjYBxHHQ>.

In this poster we compare the AEI release with RL04 and explain the differences in the preprocessing of the data, which mainly originate from a more sophisticated estimation of the scale factor (i.e. the absolute laser frequency or wavelength), a continuous data stream without biases at day bounds and a light time correction with less noise from numerical inaccuracies.