



Seasonal variability over Antarctica in GRACE data: what is the main driver and is there a fast response to climate changes?

Valentina R. Barletta (1), Andrea Bordonì (1), and Riccardo E.M. Riva (2)

(1) Dep. Earth Science - Geophysics, University of Milan, Milan, Italy (vale167@gmail.com), (2) Delft Institute of Earth Observation and Space Systems (DEOS), Delft University of Technology, The Netherlands

With its 70 meters of sea-level change in form of frozen water, Antarctica potential response to future climate changes is under constant investigation. The combination of snow accumulation and ice discharge by ice-streams is the main driver of long-term mass changes. These are monitored both with land and remote sensing campaigns, and in the last years also by measuring gravity. It is widely accepted that West Antarctic Ice Sheet (WAIS) is subject to large mass variations, while East Antarctic Ice Sheet (EAIS) seems much more stable. To understand if the Antarctic ice sheet is capable of rapid response to climate changes, we analysed the presence of unexpected seasonal variability that would stand in favour of an enhanced sensitivity to external changes. The monthly time series from the Gravity Recovery and Climate Experiment (GRACE), already used to constrain the inter-annual mass balance, are used here for a first exploration of the seasonal Antarctica variability. EAIS could be more active than expected, and that some intra- annual (seasonal) variability in the mass discharge could be missing.