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*Supplement of*

## **Detecting high spatial variability of ice shelf basal mass balance, Roi Baudouin Ice Shelf, Antarctica**

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# 1 TanDEM-X frames

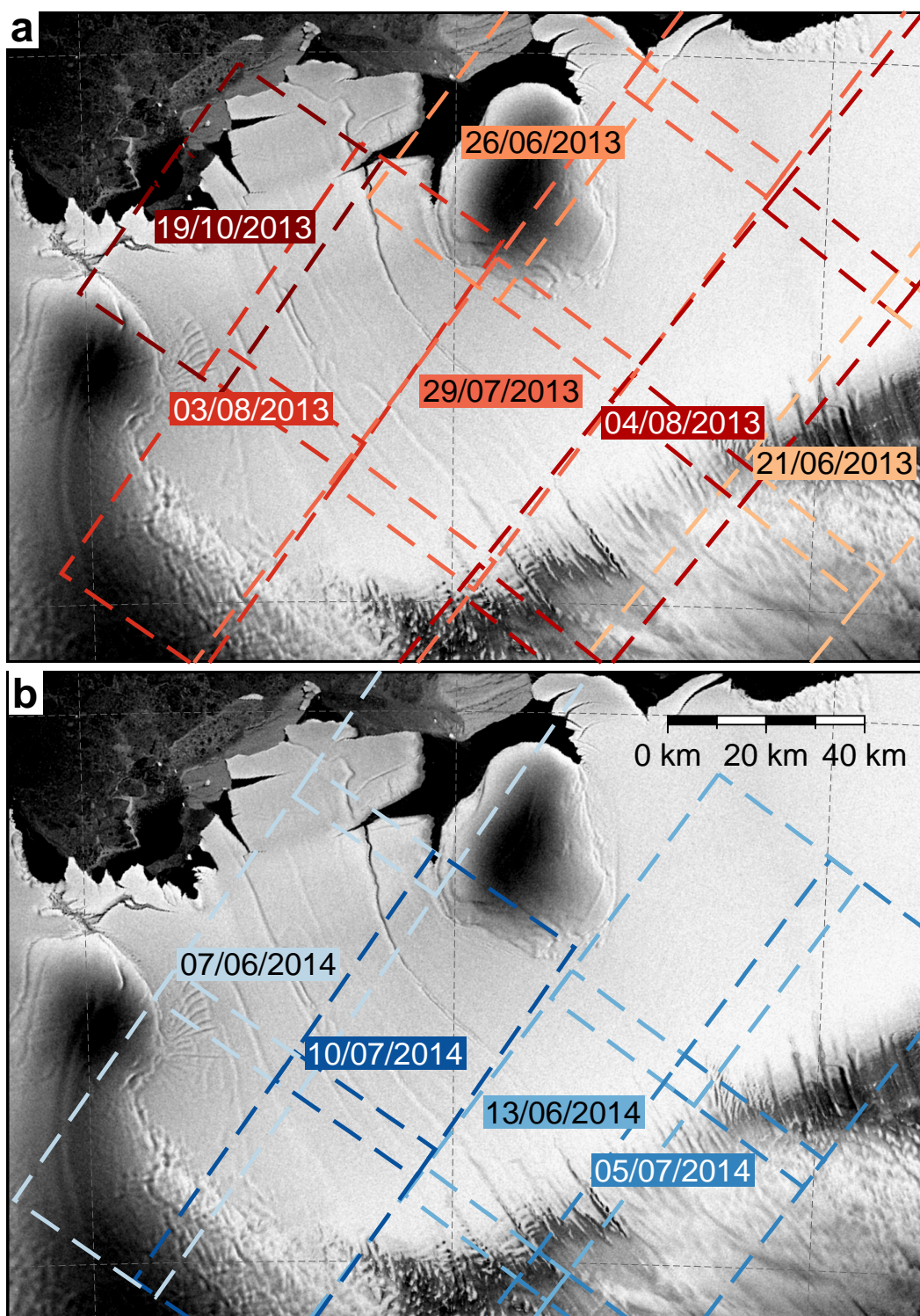


Figure S1: Frame location and dates of the TanDEM-X scenes from 2013 (a) and 2014 (b). The same color is used to represent different scenes acquired on the same day and satellite path that have been concatenated together with a linear taper and subsequently treated as one scene in our study (Sect. 2)

## 2 Gaussian filtering of TanDEM-X

Comparison between the GNSS profile from Drews (2015) and 2013 TanDEM-X DEM. Filtering the TanDEM-X elevations with a gaussian filter with a standard deviation of 7 pixels minimizes the mean and standard deviation of the difference between the GNSS and TanDEM-X elevations: which are  $-0.41 \pm 0.38$  m and  $-0.41 \pm 0.64$  m for the filtered and unfiltered case, respectively.

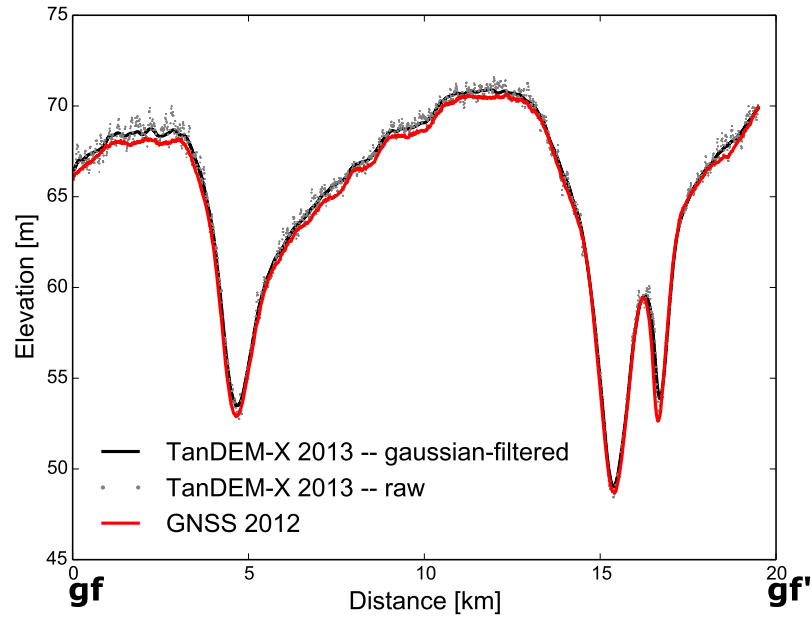


Figure S2: Comparison of unfiltered (raw) TanDEM-X 2013 , Gaussian-filtered TanDEM-X 2013 ( $\sigma = 7$ ) and 2012 GNSS elevations. The profile gf-gf' is shown in Fig. 1. The Gaussian-filtering is discussed in Sect. 2.4.

### 3 TanDEM-X validation

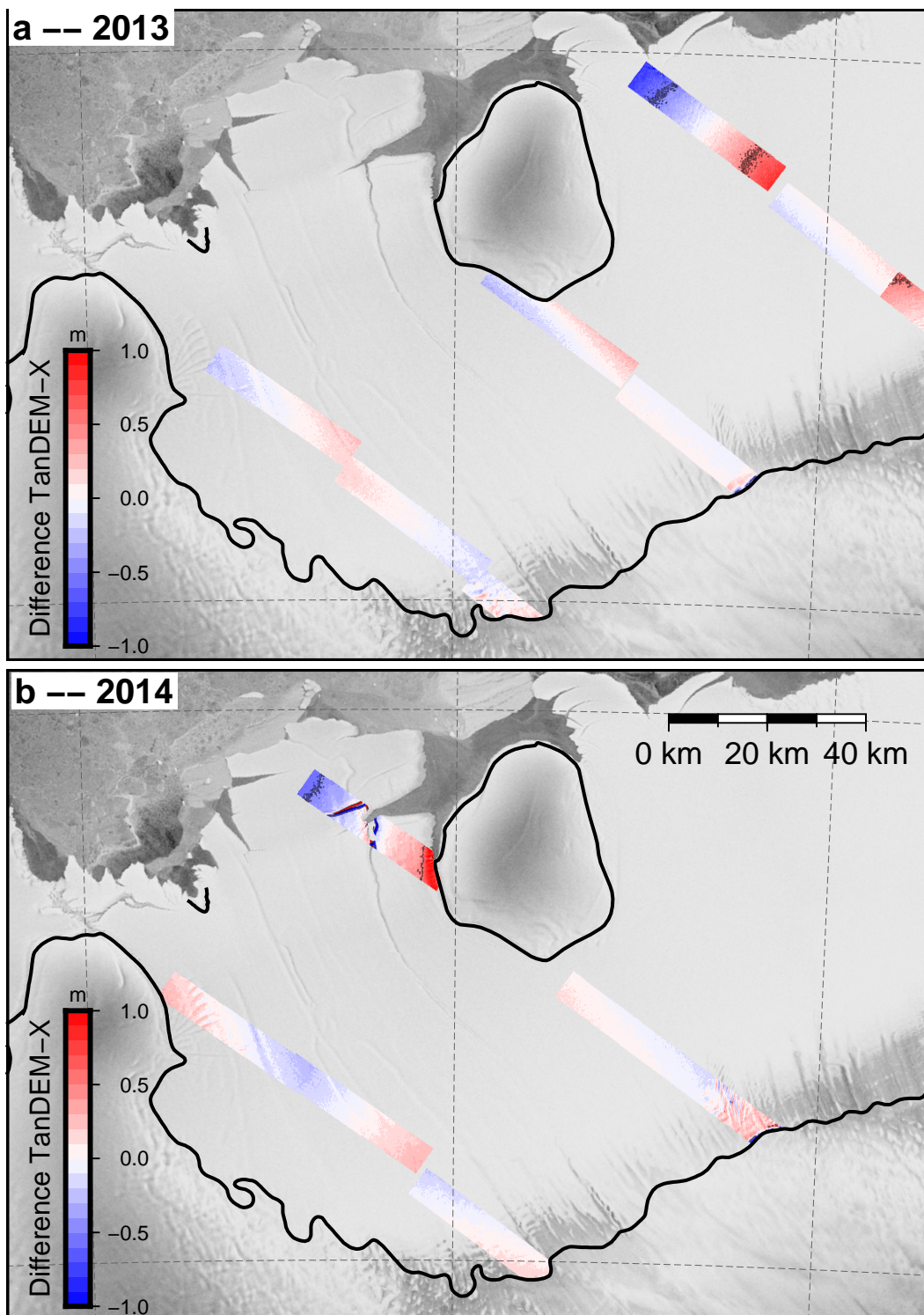


Figure S3: Elevation difference in the overlapping areas of consecutive (filtered) TanDEM-X scenes acquired the same day. The -0.5 and 0.5 contour lines have been added. This figure is discussed in Sect. 2.4 and 4.1

### References

Drews, R.: Evolution of ice-shelf channels in Antarctic ice shelves, *The Cryosphere*, 9, 1169–1181, doi:doi:10.5194/tc-9-1169-2015, 2015.