



Interseismic and Postseismic Deformation of 2023 Kahramanmaraş Earthquakes from SBOI

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1. Study Area

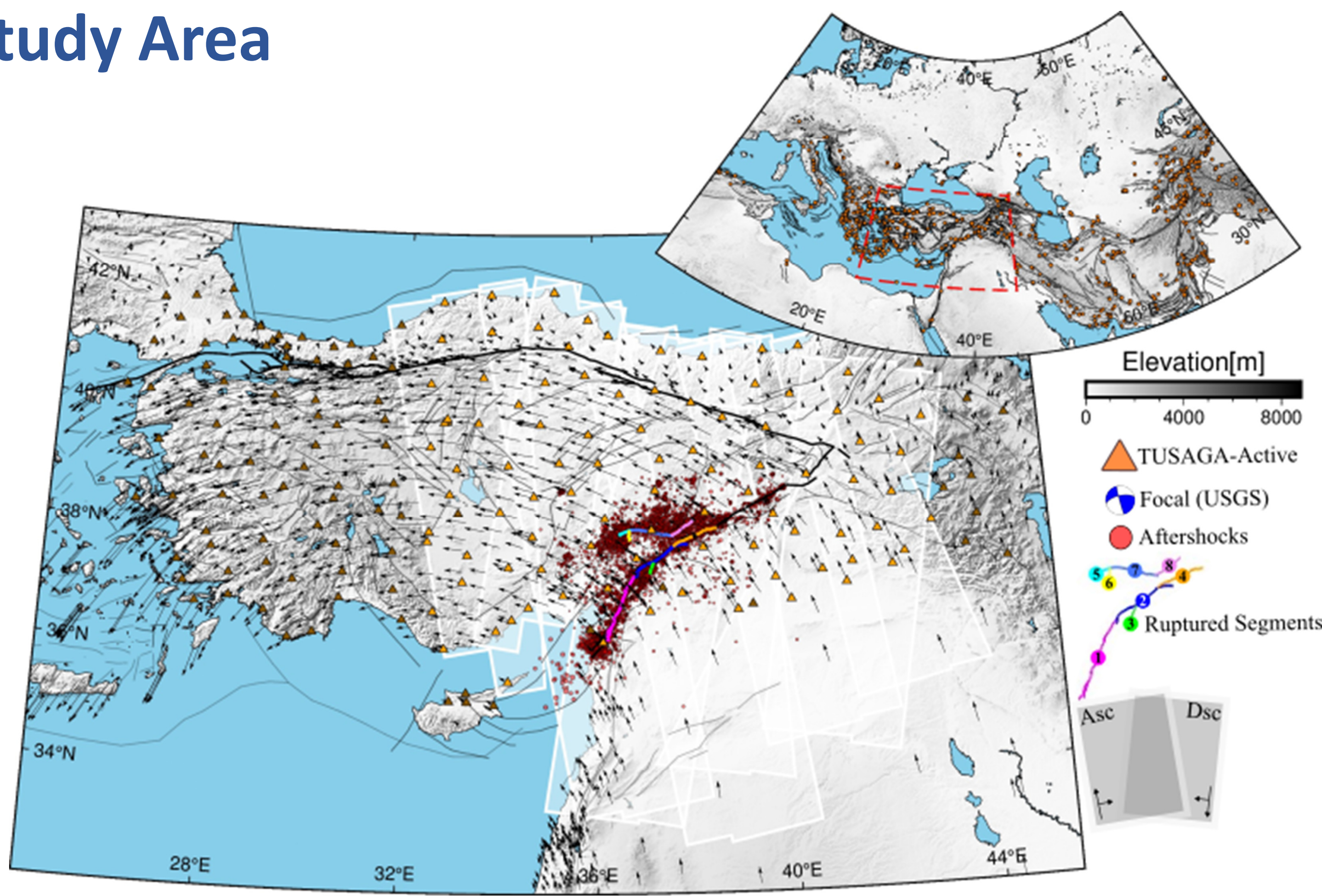


Figure: Overview map of the study area showing GNSS stations (orange triangles), 2023 Kahramanmaraş Earthquake ruptures, USGS focal mechanisms, aftershocks, and the 29 processed Sentinel-1 LiCSAR frames (white outlines). Inset shows regional context within the Alpine-Himalayan Belt.

2. LiCSBAS Time Series of LOS and SBOI

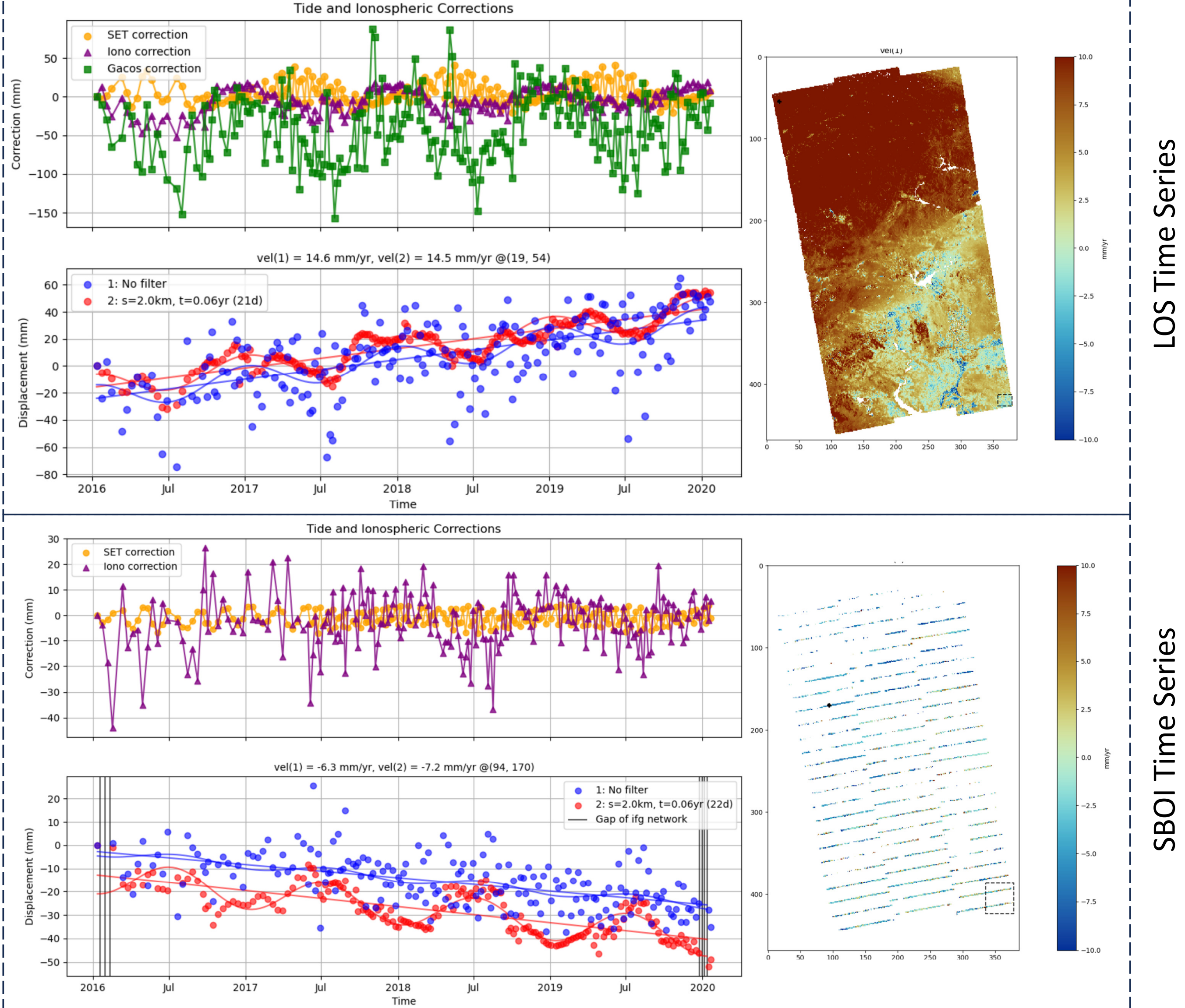


Figure: Example displacement time series showing line-of-sight (LoS) and along-track (SBOI) cumulative displacements and applied corrections for 116A_05207_252525 LiCSAR frame. Time series are corrected for atmospheric (only ionosphere for SBOI) and solid Earth tide.

3. Corrections of LOS and SBOI

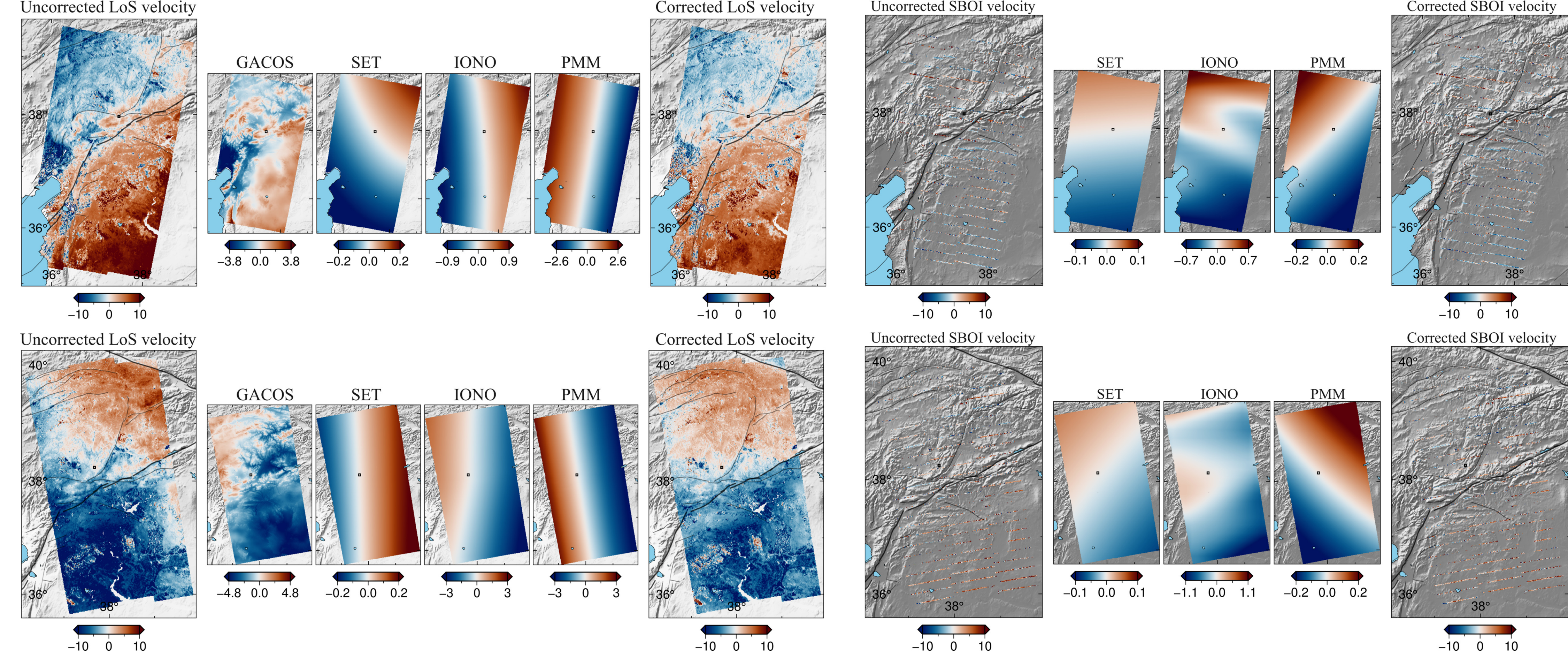


Figure: Examples of correction components applied to LiCSBAS LoS (left) and SBOI (right) velocity fields for frames 021D_05266_252525 (top) and 116A_05207_252525 (bottom), covering 2016–2020. Columns show: uncorrected velocity, GACOS (LoS only), solid Earth tide (SET), ionosphere, plate motion correction, and corrected velocity. All values in mm/yr. Black rectangles indicate reference pixels.

4. Preliminary Results

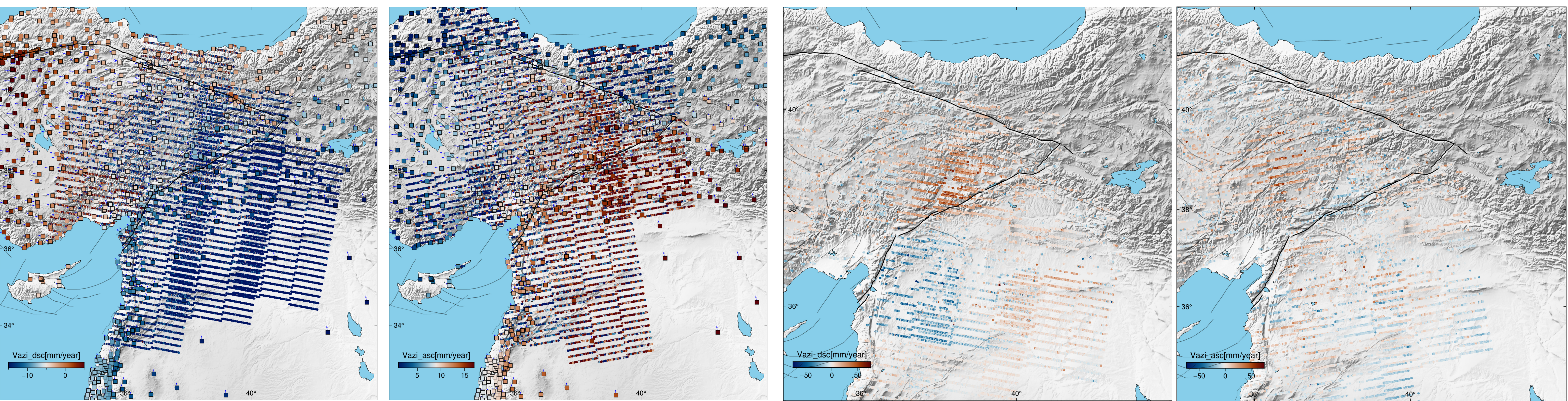


Figure: Interseismic absolute along-track velocities from LiCSBAS SBOI time-series analysis. The left panel shows descending track results, and the right shows ascending. Rectangles represent GNSS velocities projected into the along-track direction for comparison. Positive values indicate displacement in the along-track direction, northward for ascending, southward for descending.

Figure: Postseismic along-track velocities from LiCSBAS SBOI time-series analysis from 02/06/2023 to 2025/03/01. The left panel shows descending track results, and the right shows ascending. Positive values indicate displacement in the along-track direction — northward for ascending, southward for descending. Note that velocities are internally referenced within each frame, which can lead to visible discrepancies between frames. These will be corrected in future steps by fitting to GNSS observations or anchoring to a stable, zero-deformation zone.

