

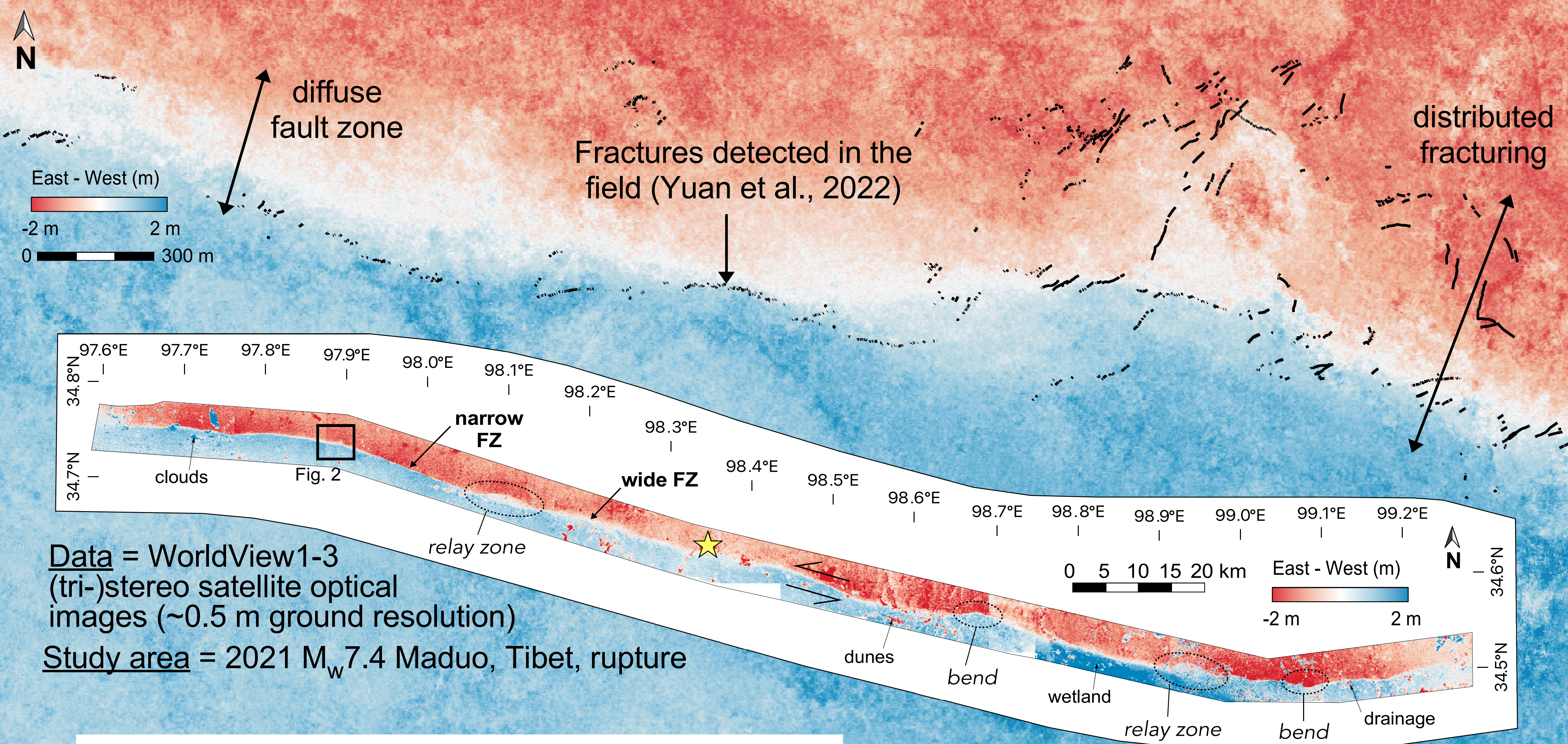
Seeing through shallow fault zones using high-resolution optical image correlation

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CONCEPT = Statistical sub-pixel correlation of pre- and post-earthquake high-resolution orthoimages
(corrected from acquisition viewing angle distortions using stereomaging 3D ground modeling)

→ Dense surface displacement field (0.5 m ground resolution, and 5-10 cm precision) → Characterization of the shallow fault zone deformation processes → Improved understanding of the earthquake rupture process, and the fault mechanical behavior



Data = WorldView1-3
(tri)-stereo satellite optical
images (~0.5 m ground resolution)

Study area = 2021 M_w 7.4 Maduo, Tibet, rupture

Assessment of the sensitivity of different datasets to
complex fault zone deformation processes:

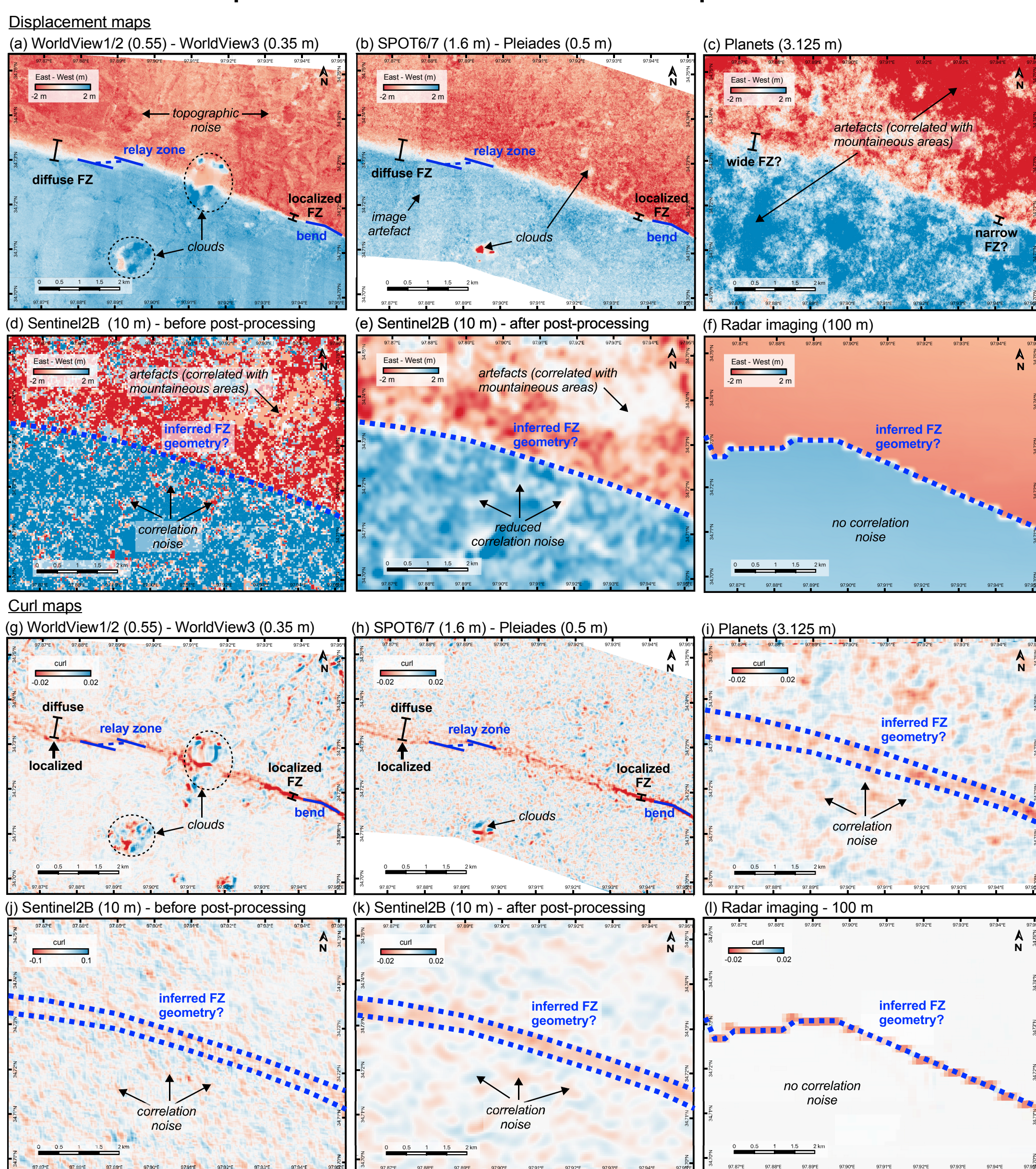


Figure 2. (a-f) East-West surface displacements calculated from OIC of various optical and radar sensors, including pre-existing data from (f.) Liu et al. (2022) and (b,h) Antoine et al. (in prep1). (g-l) Curl calculated from the E-W and N-S displacement maps.

Impact of data resolution on the measurement
of the Fault Zone (FZ) displacement:

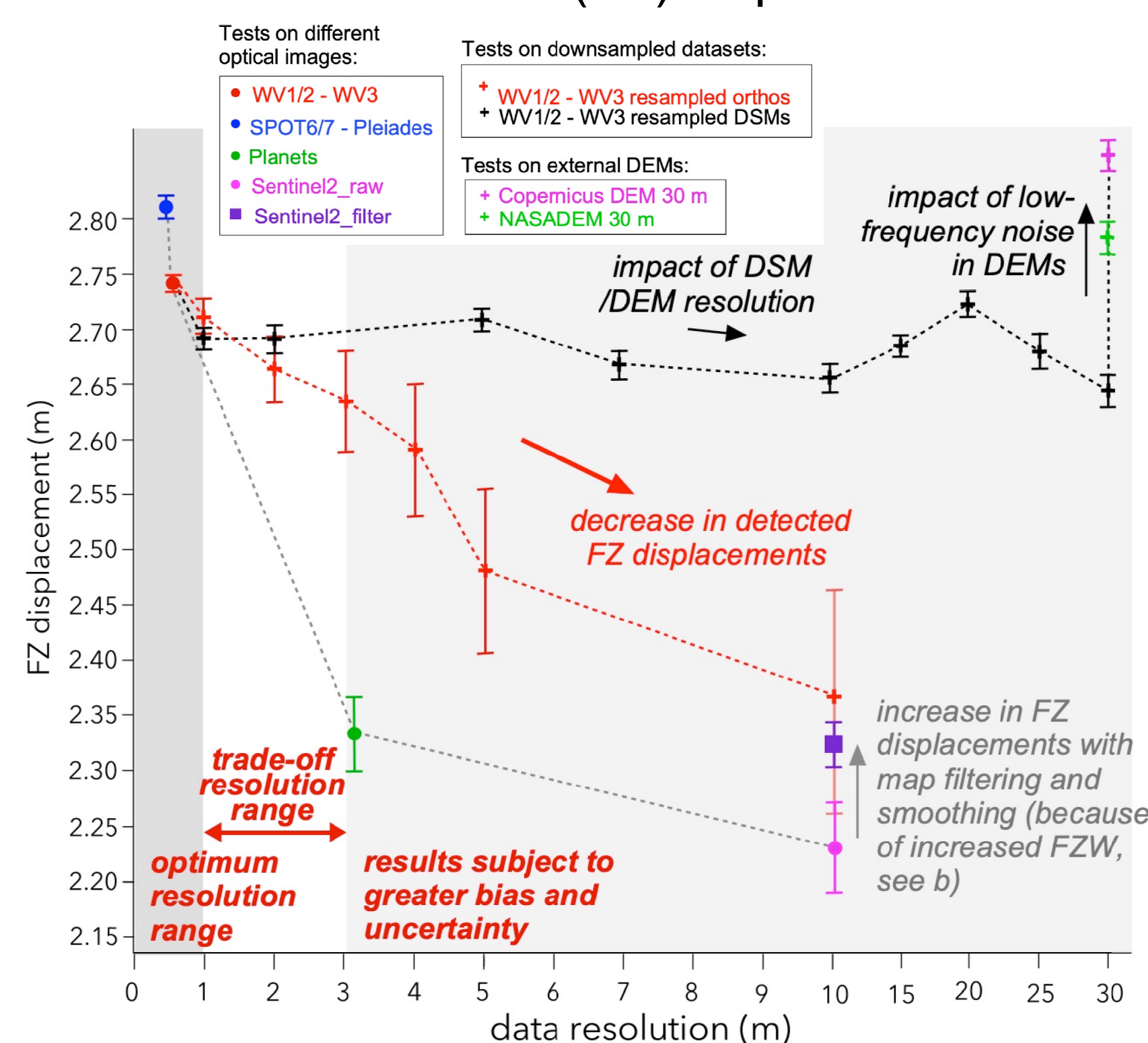


Figure 3. Evolution of the average Fault Zone (FZ) displacement with decreasing data resolution (increasing pixel size) for the different tested datasets

Towards a global high-resolution 3D
imaging of the Earth's changing surface
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Surface Topography and Vegetation
Earth Observing System

References:

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