Figure 1: Top: Google Earth snapshot of the observed area (Torre Agbar tower and surroundings). The yellow line shows the approximate projection of the slant-range vector on ground. Bottom: Average SAR backscatter. The spatiotemporal tomographic inversion of the scatterer marked in blue and the scatterers along the red line are presented in Figures 2 and 3, respectively.
Figure 2: Spatiotemporal inversion of a scatterer at the tip of Torre Agbar building (marked with a blue cross in figure 1).

**a:** The elevation profiles obtained: without including deformation-velocity and thermal expansion in the phase model (blue); including deformation-velocity but not thermal expansion (black); considering an extended phase model including both deformation velocity as well as thermal expansion (red). The scatterer is well focused at the correct elevation (PLOS distance) only with the extended phase model.

**b:** Deformation velocity – elevation plane obtained with differential tomography. Thermal expansion induced phase term is not modeled. The inversion is not satisfactory, as there is no evident peak.

**c:** Deformation velocity – elevation plane obtained with differential tomography with extended phase modeling for thermal expansion. The scatterer is now well-focused.

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**Figure 2:** Spatiotemporal inversion of a scatterer at the tip of Torre Agbar building (marked with a blue cross in figure 1). **a:** The elevation profiles obtained: without including deformation-velocity and thermal expansion in the phase model (blue); including deformation-velocity but not thermal expansion (black); considering an extended phase model including both deformation velocity as well as thermal expansion (red). The scatterer is well focused at the correct elevation (PLOS distance) only with the extended phase model. **b:** Deformation velocity – elevation plane obtained with differential tomography. Thermal expansion induced phase term is not modeled. The inversion is not satisfactory, as there is no evident peak. **c:** Deformation velocity – elevation plane obtained with differential tomography with extended phase modeling for thermal expansion. The scatterer is now well-focused.
Figure 3. Results of spatiotemporal inversion using differential tomography with extended phase modeling. **Top:** A tomographic slice along the Torre Agbar building and immediate neighborhood. **Bottom:** The reflectivity at the peak locations is shown; a simple threshold, marked in dotted-red line, provides discrimination among the noisy and the well-focused scatterers (marked in red). **Middle figures:** An estimate of the average deformation velocity and the phase-to-temperature sensitivity.