



S21A-2687: Assessment of Pre-earthquake Land Surface Temperatures in 20 Case Studies Worldwide

Tuesday, 13 December 2016

08:00 - 12:20

📍 *Moscone South - Poster Hall*

Anomalous TIR emissions have been proposed as a potential precursor to earthquakes. So-called thermal anomalies of +2-13°C in air, at-sensor and land surface temperatures (LST) have been reported, usually within a month before large earthquakes. However, distinguishing normal from anomalous, potentially earthquake-related emissions is challenging because of the variety of factors that influence the satellite signal, like atmospheric composition, land cover and geomorphology.

We use geostationary, hypertemporal, atmospherically-corrected LST data. We examine time series before and after 20 earthquake cases between 2010-2015 around the globe. We study earthquakes of magnitude between M5.7 and M9.0, of different focal mechanisms and of shallow focal depth (with the exception of the medium-focus M7 Ecuador 2010 earthquake). Eighteen earthquakes in our study were land-based, and two offshore. We apply a recently published methodology which can distinguish localized signal fluctuations as low as 2K. We study the same areas in years with and without earthquake occurrence, and we also apply the methodology in areas where no earthquake has been registered. We estimate the uncertainty of our findings, accounting for positional, sensor-related and atmospheric influences. We assess our results considering physically realistic distances, relation to causative faults and geographical and geological environmental settings.

Authors

[Efthymia Pavlidou](#) *

University of Twente

[Harald van der Werff](#)

University of Twente

[Mark van der Meijde](#)

University of Twente

[Christoph Hecker](#)

University of Twente

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