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# Landsat 8-TIRS NEΔT at Kīlauea Volcano and the Active East Rift Zone, Hawaii

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**Abstract :** The radiometric performance of remotely sensed images is important for volcanic monitoring. The Thermal Infrared Sensor (TIRS) on-board Landsat 8 was designed with specific requirements in regard to the noise-equivalent change in temperature (NEΔT) at ≤ 0.4 K at 300 K for the two thermal infrared bands B10 and B11. This study investigated the on-orbit NEΔT of the TIRS two bands from a scene-based method using clear-sky images over the volcanic activity of Kīlauea Volcano and the active East Rift Zone (Hawaii), in order to optimize the use of TIRS data. Results showed that the NEΔTs of the two bands exceeded the design specification by an order of magnitude at 300 K. Both separate bands and split window algorithm were examined to estimate the effect of NEΔT on the land surface temperature (LST) retrieval, and NEΔT contribution to the final LST error. These results were also useful in the current efforts to assess the requirements for volcanology research campaign using the Hyperspectral Infrared Imager (HyspIRI) whose airborne prototype MODIS/ASTER instruments is plan to be flown by NASA as a single campaign to the Hawaiian Islands in support of volcanology and coastal area monitoring in 2016.

**Keywords :** landsat 8, radiometric performance, thermal infrared sensor (TIRS), volcanology
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