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Shape Model of Ionospheric Disturbances Excited by Space Shuttle Ascent, and its Application for Detection of Earthquake-Excited Disturbances

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In this paper, the GPS data collected at a permanent GPS station on Bermuda Island during the ascent of Space Shuttle Columbia on 18 October 1993 from Kennedy Space Center (Cape Canaveral, Florida, USA) for the STS-58 mission is reprocessed and the results are regenerated to develop a Shape Model for the perturbation detected. The same processing algorithm is applied onto the GPS data collected at a Mediterranean GPS Network's station called TUBI during 1999's Izmit earthquake in Turkey. This station is located in Izmit province itself. By manupilating and passing the Total Electron Content through a high-pass filter, the energy released by the earthquake is thought to be detected. The efficiency of the Shape Model developed for the ascent of Space Shuttle is evaluated against the results of the earthquake and this evaluation shows indications of potential benefits of this model in the future.