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Surface Pressure Fluctuations Produced by Total Solar Eclipse of 1 August 2008

The purpose of this presentation is to estimate the surface atmospheric pressure fluctuations produced by the passage of the 1 August 2008 total solar eclipse and to compare these pressure fluctuations with those recorded by a temporary network of microbarographs and by the infrasound stations of the International Monitoring System. The surface pressure fluctuations expected at all the measurement sites are estimated using a linear spectral numerical model. It is shown that the cooling of both the ozonosphere and the troposphere can produce detectable pressure fluctuations at the ground surface but that the tropospheric cooling is likely to be the predominant source. Since the expected eclipse signals are in a frequency range that is highly perturbed by atmospheric tides and meteorological phenomena, the pressure fluctuations produced by these latter synoptic disturbances are characterized and removed from the recorded signals. Low-frequency gravity waves starting just after the passage of the eclipse are then brought to light at most measurement sites. The time-frequency characteristics of these waves are similar to those obtained from the model, which strongly suggests that these waves were produced by the passage of the 1 August 2008 solar eclipse.

Primary author: MARTY, Julien (CTBTO)

Presenter: MARTY, Julien (CTBTO)

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