

## Acoustic resonance between the Earth and the atmosphere

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In most cases the atmosphere is treated as vacuum by seismologists. This approximation is good for seismic waves excited by earthquakes in the solid Earth. However, coupling between the atmosphere and the solid Earth becomes important if the atmospheric phenomena excite the Earth's free oscillations such as the eruption of Mt. Pinatubo and Earth's background free oscillations. In the later case, the coupled mode shows a greater annual variation than the oscillations decoupled with the atmospheric oscillations. This amplification should depend critically on how well the resonance occurs between the solid Earth and the atmosphere. Simple estimation shows that change of acoustic structure of the atmosphere can cause the amplification.