

Numerical simulation of surface pressure fluctuation associated with thermal convection

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Recent technological developments in the solid earth observation have established that the free oscillation of the earth is incessantly excited in the absence of large earthquakes. Atmospheric motions are proposed as possible causes, but it is not clear what type of disturbances is responsible. Here we investigate one of the candidates, thermal convection, by two-dimensional numerical simulation based on fully compressible system of equations. The result shows that, in addition to the component whose spatial and temporal scale corresponds to that of the convective cells, small but non-zero power of large scale, high frequency surface pressure fluctuation is excited, and its amplitude is roughly proportional to the square of the convective heat flux.