Earth and Space Science

Supporting Information for

Long Period Seismology on Titan in the Presence of a Methane Clathrate Lid

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Introduction

We have included synthetic seismic record sections as an example of how the body waves propagate over the surface of the Titan models from 0 to 180 epicentral distance degrees.

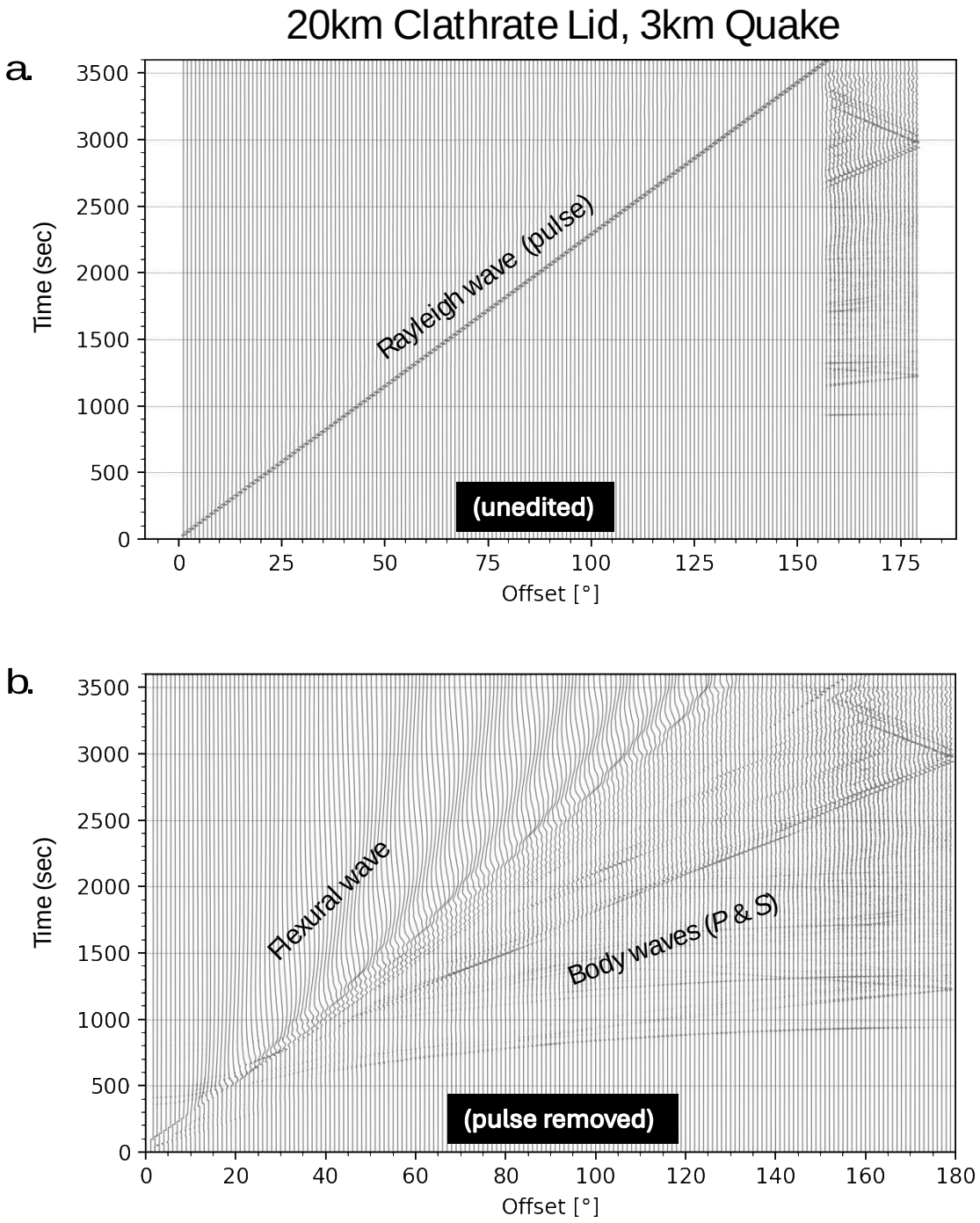

Figure S1. Complete record section of the *AxiSEM* generated synthetic seismograms in the vertical (Z) component, which served as mock observational data. Data shown for a 20km methane clathrate lid. (a) unedited- the high amplitude Rayleigh wave (pulse) dominates the seismograms, (b) the Rayleigh (pulse) has been cut out of the seismograms to show the body waves and a prominent flexural wave within the ice shell.

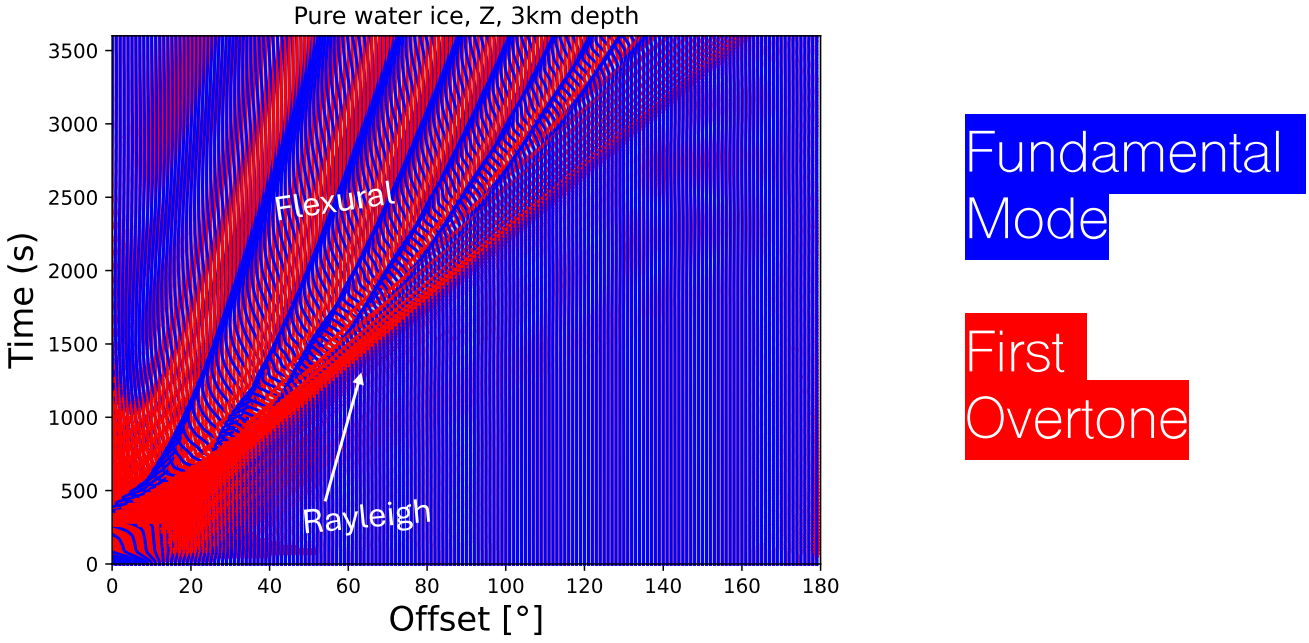

Figure S2. Complete record section of *Mineos* generated synthetic seismograms in pure water ice—vertical (Z) component, 3km depth, which served as theoretical data. The fundamental mode containing the low frequency flexural wave is plotted in blue and the first overtone containing the Raleigh wave is plotted in red.