Auxiliary material for

GRAIL gravity constraints on the vertical and lateral density structure of the lunar crust

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Introduction

The auxiliary material contains details about the modeling approach (analytical admittance) and data reduction (effective density spectra computation and multitaper localization). It also presents the statistical, Monte Carlo error analysis and discusses the robustness of the results. Finally, the physical approach for the seismic velocity comparison (cf. Fig. 4 of main text) is given in detail.

The auxiliary material is included in a single PDF file labeled ‘Auxilliary_material.pdf’.
Figures and tables are directly embedded in the various sections (see lists below).

The section heads are as follows:

Below is a list of the figures and tables in the various sections:

Fs01. Definition sketch for the theoretical admittance calculations
Fs02. Comparison between analytical and synthetic effective density spectra
Fs03. Average farside characteristics
Fs04. Example of a population of synthetic density spectra obtained from a set of 1000 random Monte Carlo realizations of a synthetic gravity field
Fs05. Definition of the error bars on the best-fit parameters
Fs06. Spatial variability of the fit quality for the exponential model density profile and associated estimated uncertainties on best-fit parameters
Fs07. Statistical difference between the low density (porous) layers of SP-A and the rest of farside
Fs08. Effect of higher spectral resolution at the expense of a lower multitaper spatial resolution
Fs09. Effect of a constant deep density ρ_0 and of the values of the upper and lower bounds for the fit's degree range on the spatial patterns of the best-fit parameters – example with the exponential density model profile
Fs10. Column-averaged crustal density and corresponding porosity over degree range $l = l_{\text{max}} - l_{\text{max}}$
Fs11. Averaged radial variation for various parameters within the South Pole-Aitken (SP-A) basin region

Ts01. GRAIL and LOLA data used in this study
Ts02. Example of best-fit parameters at the two locations of Fig. 3 for different fit parameters of the exponential model
Ts03. Various anorthosite-like elastic properties used to derive compressional seismic velocities from the three-phase model