

NON-NEWTONIAN FORCES AND THE OBSERVED SOLAR OSCILLATION SPECTRUM

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ABSTRACT. Motivated by recent interest in the possibility of a long range gravitation-like force we have considered the effects a deviation from the Newtonian force law would have on the solar normal mode spectrum. Observations of low order and degree modes provide the most interesting limits to possible new physics. The constraint from solar oscillation observations is distinct from other planetary data in that it provides an integral bound on force law deviations on spatial scales between roughly 2×10^4 km and planetary scales. This limit is $-0.02 \leq \delta G/G \leq 0.3$ and is presently limited by systematic differences between the low- l observations and uncertainty in the solar model.