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【455】 Coupling elastic media to gravitational waves: an effective field theory approach

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We develop a generally covariant theory of elasticity, using the methods of modern effective field theory, and provide a consistent derivation of the interaction between a gravitational wave (GW) and an elastic body. The field-theoretical results, derived in the transverse-traceless (TT) frame, are valid for all GW frequencies and provide corrections to the already existing results in the literature. Beside an intrinsic conceptual interest, these results are relevant to the computation of the sensitivity of the recently proposed Lunar Gravitational Wave Antenna. We also discuss the transformation between these results in the TT frame and the standard equations in the proper detector frame.

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