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Gravity Waves Produced by a Fluctuating Stress Tensor during Inflation[1] L.H. FORD, Tufts Univ., CHUN-HSIEN WU, Soochow Univ., JEN-TSUNG HSIANG, Dong Hwa Univ., KIN-WANG NG, Academia Sinica — We show that the vacuum fluctuations of the stress tensor of a quantum field can produce tensor perturbations in inflationary models. These are passive fluctuations of gravity driven by the stress tensor, and hence distinct from the mechanism usually considered to produce gravity waves in inflation. Here we analyze the case of a conformally invariant quantum field, such as the electromagnetic field. The perturbations produced during inflation result in a spectrum of fluctuating gravity waves whose magnitude grows with increasing duration of the inflationary period. This primordial spectrum is non-scale invariant, being enhanced at shorter wavelengths, and non-Gaussian in character. The fact that its effects have not yet been observed may be used to place limits upon the duration of the inflationary period. This limit is compatible with adequate inflation to solve the horizon and flatness problems, but raises the possibility that the gravity waves from stress tensor fluctuations during inflation might be observable.

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