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The Breakin Strain of Neutron Star Crust and Continuous Gravitational Wave Radiation C.J. HOROWITZ, Indiana University, K. KADAU, LANL, J. HUGHTO, D.K. BERRY, Indiana University — Mountains on rapidly rotating neutron stars efficiently radiate gravitational waves. The maximum possible size of these mountains depends on the breaking strain of neutron star crust. We use large scale molecular dynamics simulations of Coulomb solids to determine the breaking strain. We find that the breaking strain of small single crystals is very large and that this strength is only modestly reduced by impurities, defects, and grain boundaries. Therefore, neutron star crust is likely very strong and can support mountains large enough so that their gravitational wave radiation could limit the spin periods of some stars and might be detectable in large scale interferometers.

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