The superflares of soft γ-ray repeatres: giant quakes in solid quark stars?

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Three times of supergiant flares from soft γ-ray repeatres are observed, with typical released energy of $\sim 10^{44-47}$ erg. A conventional model (i.e., the magnetar model) for such events is catastrophic magnetism-powered instability through magnetohydrodynamic process, in which a significant part of short γ-ray bursts could also be the results of magnetars. Based on various observational features (e.g., precession, glitch, thermal photon emission) and the underlying theory of strong interaction (quantum chromodynamics, QCD), it could not be ruled out yet that pulsar-like stars might be actually solid quark stars. Strain energy develops during a solid star's life, and star quakes could occur when stellar stresses reach a critical value, with huge energy released. An alternative model for supergiant flares of soft γ-ray repeatres is presented, in which energy release during a star quake of solid quark stars is calculated. It is found that general observational features could be reproduced in this model.