Abstract Submitted
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Neutron starquakes caused by spin-down[1] JAVIER ARENAS RENCORET, Pontifical Catholic University of Valparaiso, CLAUDIA AGUILERA, Universidad Andrés Bello, ANDREAS REISENEGGER, Universidad Metropolitana de Ciencias de la Educación — Pulsars rotate at a precise frequency, from which a spin-down is also observed in time. The star has an ellipsoidal shape when it is rotating. It is composed by a fluid core and a thin solid crust, which goes towards a more spherical shape due to the spin-down. Previous works show that the interior of the crust displaces slightly more than the surface, producing a greater stress at the equator, where the solid should breaks. We show that, in a star with a denser fluid core, the interior of the crust-core interface moves much less than the surface (with a greater radial gradient hence radial strain towards the interior than in the previous works). This displacement moves the breaking point to the pole, where the stress is larger. This type of deformation increases the mountains, and accumulates more elastic energy than the former, which could eventually be released when the crust breaks or yields in a singular event called starquake. If angular momentum is conserved during the yields, starquakes produce spin-ups similar to glitches observed in pulsars. We show that the change in moment of inertia by spin-down and rigidity of the star is not capable of explaining all glitch activity, even the activity of small glitches. Thus, starquakes by spin-down are less frequent than glitches.

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