Contribution ID: **4** Type: **not specified**

# The Critical Strain Angle along the Neutron Star Crust

*Monday 25 April 2016 14:00 (20 minutes)*

We estimate the critical strain angle throughout the neutron star crust. We propose that the critical strain angle is proportional to the ratio of the total Coulomb potential energy to the kinetic energy of the relativistic electrons, $\theta_{cr} \sim E_C/E_K$, in one Wigner-Sietz cell. Since the character of the Coulomb interaction varies throughout the inner crust according to the shapes of the nuclear pasta geometries (i.e. spherical, rod, slab), the critical strain angle is also variable from layer to layer. We found that $\theta_{cr}$ is around $0.1$ in the outer crust which is in agreement with the numerical results of Horowitz&Kadau(2009), whilst it reduces to $10^{-2} - 10^{-3}$ in the inner crust where the rod-like and slab-like configurations exist, thus the crust becomes more fragile. We also include the weak screening effect in terms of the Thomas-Fermi model that doesn't change the results appreciably. Our results are also compatible with the recently observed minimum glitch of the Crab pulsar in the scope of the starquake model from which we also obtain some clues about the nature of the fracturing process and the vortices unpinning in the inner crust.

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**Session Classification:** Afternoon session