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Nonradial superfluid modes in oscillating neutron stars

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(Submitted on 21 Jul 2011 (v1), last revised 24 Jan 2012 (this version, v2))

For the first time nonradial oscillations of superfluid nonrotating stars are self-consistently studied at finite stellar temperatures. We apply a realistic equation of state and realistic density dependent model of critical temperature of neutron and proton superfluidity. In particular, we discuss three-layer configurations of a star with no neutron superfluidity at the centre and in the outer region of the core but with superfluid intermediate region. We show, that oscillation spectra contain a set of modes whose frequencies can be very sensitive to temperature variations. Fast temporal evolution of the pulsation spectrum in the course of neutron star cooling is also analysed.

Comments: 5+ pages, 4 figures, published version. Eqs. (3) and (5) and a few typos are corrected; results unchanged

Subjects: **Solar and Stellar Astrophysics (astro-ph.SR)**; High Energy Astrophysical Phenomena (astro-ph.HE); General Relativity and Quantum Cosmology (gr-qc)

Journal reference: MNRAS 418 (2011) L54-L58

Cite as: **arXiv:1107.4242 [astro-ph.SR]**

(or **arXiv:1107.4242v2 [astro-ph.SR]** for this version)

Submission history

From: Gusakov Michael [[view email](#)]

[v1] Thu, 21 Jul 2011 11:46:44 GMT (446kb)

[v2] Tue, 24 Jan 2012 11:47:02 GMT (446kb)

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