

## Efek Medan Listrik di Permukaan Bintang Neutron = Electric Field effect on the surface of a neutron star

Riza Ibnu Adam

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Abstrak

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Di permukaan bintang neutron, perubahan kerapatan partikel yang signifikan dapat menghasilkan separasi muatan dalam bentuk lapisan dipol listrik. Pada penelitian ini dipelajari efek medan listrik akibat lapisan tersebut terhadap properti dari bintang neutron. Untuk memodelkan kerapatan lapisan dipol listrik, kami menggunakan dua fungsi Gaussian. Pada perhitungan ini kami gunakan dua model dengan asumsi berbeda, yakni: model dengan asumsi bahwa bintang neutron hanya tersusun atas p, n, e dan serta model dengan asumsi bintang neutron tersusun dari p, n, e, dan hyperon. Hasil yang diperoleh menunjukkan bahwa massa maksimum tidak sensitif terhadap medan listrik di permukaan, tetapi radius bintang dengan massa kanonik 1.4M<sub>b</sub> cukup sensitif terhadap medan listrik. Bintang neutron dengan hyperon bersifat lebih soft dibandingkan bintang neutron tanpa hyperon

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<b>ABSTRACT</b><br>

On the surface of a neutron star, a significant particle density changes can produce charge separation in the form electric dipole layer. This research studied electric field effect from the dipole layer on the properties of neutron star. For modeling electric dipole layer density, we use two Gaussian functions. We use two models with different assumptions: namely a model which assumes the neutron star is only composed of p, n, e and and a model which assumes the neutron star is composed of p, n, e, and hyperon. The result shows that the maximum mass is not sensitive to the electric fields on the surface, but the radius of star with canonical mass 1.4M<sub>b</sub> is quite sensitive to electric fields. The neutron star with hyperon is softer than without hyperon; On the surface of a neutron star, a significant particle density changes can produce charge separation in the form electric dipole layer. This research studied electric field effect from the dipole layer on the properties of neutron star. For modeling electric dipole layer density, we use two Gaussian functions. We use two models with different assumptions: namely a model which assumes the neutron star is only composed of p, n, e and and a model which assumes the neutron star is composed of p, n, e, and hyperon. The result shows that the maximum mass is not sensitive to the electric fields on the surface, but the radius of star with canonical mass 1.4M<sub>b</sub> is quite sensitive to electric fields. The neutron star with hyperon is softer than without hyperon, On the surface of a neutron star, a significant particle density changes can produce charge separation in the form electric dipole layer. This research studied electric

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