Model Teoretis Bintang Neutron Berotasi Lambat dengan Parameterisasi Persamaan Post-Tollman-Oppenheimer-Volkoff = Theoretical Model of Slow Rotating Neutron Star with Parameterized Post-Tollman-Oppenheimer-Volkoff Equation

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Abstrak

Pengamatan dan tafsiran terhadap gelombang gravitasi GW 170817 akibat benturan dua bintang neutron menghasilkan batasan-batasan (constraint) terhadap massa dan jarijari bintang neutron. Batasan-batasan tersebut dibandingkan dengan hasil simulasi massa dan jari-jari bintang neutron yaitu menggunakan parameterisasi persamaan post-TOV (Tollman - Oppenheimer - Volkoff). Parameterisasi persamaan post-TOV memberikan fleksibilitas lebih jika dibandingkan dengan relativitas standar (General Relativity) terhadap data pengamatan. Dalam penelitian ini ditemukan adanya kombinasi-kombinasi parameter bebas dalam model massa dan jari-jari yang ada dalam batasan-batasan GW 170817. Dan ditemukan juga dampak dari parameterisasi pemodelan massa - jari-jari terhadap sifat-sifat momen inersia bintang dan sifat-sifat kerak meliputi massa , ketebalan kerak dan momen inersia serta sifat frekuensi Kepler.
.....Observations and interpretation of gravitational wave GW 170817, which is the result of two colliding neutron stars, results in constraints of neutron star's mass and radius. These constraints are compared to simulation results of neutron star's mass and radius, using parameterisation of post-TOV (Tollman-Oppenheimer-Volkoff) equations. Parameterisation of post-TOV equations provides extra flexibility compared to standar relativity (General Relativity) in regard to observed data. This research discovers combinations of free parameters in mass and radius models which are within the constraints of GW 170817. Also discovered are the effects of parameterization mass-radius modeling to properties of the star's inertial moment and the properties of the star crust's mass, thickness and inertial moment, also the properties of Kepler frequency.