# Population synthesis as a probe of neutron star thermal evolution

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The study of thermal emission from isolated, cooling neutron stars plays a key role in probing the physical conditions of both the star crust and the core. The comparison of theoretical models for the star thermal evolution with the surface temperature derived from X-ray observations of sources of different age is one of the main tools to investigate the properties of neutron star interiors and to constrain the equation of state. Here we propose to use population synthesis studies as an independent approach to test the physics governing the star cooling. Theoretical Log N-Log S distributions depend on the assumed neutron star thermal evolution. We have computed distributions for several different cooling scenarios and found that comparison with the observed Log N-Log S of isolated neutron stars is effective in discriminating among cooling models. The Log N-Log S test, being a "global" one and despite some limitations, appears capable to ideally complement the standard temperature vs. age test used up to now.