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Crustal Heating During the Epoch of Crust Replacement

MATTHEW CAPLAN, Illinois State University, ANDREW CUMMING, McGill University — Neutron stars in X-ray binaries may completely replace their crusts with accreted matter. If the composition of the material freezing out of the ocean changes then the structure of the reaction layers in the crust should change, resulting in fluctuations in crustal heating. Recent work has calculated the composition and heat sources in steady state accreted neutron star crusts and uses them to study the evolution of the heating in partially replaced 'hybrid crusts.' In addition, we report calculations of the heating in hybrid crusts formed during the replacement of cold catalyzed crusts by accreted matter and make suggestions for resolving crust replacement observationally.

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