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Mapping Neutron Star Crusts with the Lightcurves of Quasi-Persistent Transients[1] EDWARD BROWN, Michigan State University, ANDREW CUMMING, McGill University — The quiescent emission from neutron star transients with long accretion outbursts can inform us about the physics of dense matter. We construct models of the thermal relaxation of the neutron star crust following the end of an accretion outburst. In agreement with Shternin et al., we find that the thermal conductivity of the neutron star crust is high, consistent with a low impurity concentration. The lightcurve has the form of a broken power-law. The initial power-law decay gives a direct measure of the crust temperature profile in the outer crust. The time of the break, at hundreds of days post-outburst, corresponds to the thermal time where the crust transitions from a classical to a quantum crystal, close to neutron drip. We calculate in detail the constraints on the crust parameters of both KS 1731-260 and MXB 1659-29 from fitting their cooling lightcurves.

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Edward Brown
Michigan State University

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