Abstract Submitted
for the APR07 Meeting of
The American Physical Society

Light Curves of Millisecond-Period Accreting X-ray Pulsars SHARON MORSINK, University of Alberta, DENIS LEAHY, University of Calgary, COIRE CADEAU, University of Alberta — We present the first raytracing computations for light emitted from the surface of a rapidly rotating neutron star in order to construct light curves for X-ray pulsars and bursters. These calculations are for realistic models of rapidly rotating neutron stars which take into account both the correct exterior metric and the oblate shape of the star. Our motivation is to test the validity of the commonly used Schwarzschild + Doppler approximation (S+D). We find that the most important difference between the exact calculation and the S+D approximation arising from rotation comes from the oblate shape of the rotating star. We find that approximating a rotating neutron star as a sphere introduces serious errors in fitted values of the star's radius and mass if the rotation rate is very large. We will explain the simple geometric origin of the effect and present simple approximations that allow the oblate shape to be properly included in raytracing programs which use the Schwarzschild metric.

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Date submitted: 12 Jan 2007 Electronic form version 1.4