A NuSTAR observation of the reflection spectrum of the low-mass X-ray binary 4U 1728-34

We report on a simultaneous NuSTAR and Swift observation of the neutron star low-mass X-ray binary 4U 1728-34. We identified and removed four Type I X-ray bursts during the observation in order to study the persistent emission. The continuum spectrum is hard and described well by a blackbody with $kT = 1.5$ keV and a cutoff power law with $\Gamma = 1.5$, and a cutoff temperature of 25 keV. Residuals between 6 and 8 keV provide strong evidence of a broad Fe Kα line. By modeling the spectrum with a relativistically blurred reflection model, we find an upper limit for the inner disk radius of $R_{\text{in}} \leq 2R_{\text{ISCO}}$. Consequently, we find that $R_{\text{NS}} \leq 23$ km, assuming $M = 1.4 M_\odot$ and $a = 0.15$. We also find an upper limit on the magnetic field of $B \leq 2 \times 10^8$ G.