Chandra Observations of the Anomalous X-ray Pulsar 1E 2259+58.6

S. K. Patel, C. Kouveliotou, P. M. Woods, M. H. Finger (*USRA/NSSTC*), A. F. Tennant, M. C. Weisskopf (*NASA/MSFC*), F. Paerels, J. Vink (*Columbia U.*), E. Göğüş (*UAH*), M. van der Klis (*U. Amsterdam*), T. Belloni (*Osservatorio di Brera*)

Abstract

We present X-ray imaging, timing, and phase resolved spectroscopy of the anomalous X-ray pulsar 1E 2259+58.6 using the *Chandra X-ray Observatory*. Time resolved X-ray spectra show no significant variation as a function of pulsar spin phase. The phase averaged spectrum is well described by a power law plus blackbody model with $\Gamma = 3.6(1)$, $kT_{\rm BB} = 0.412(6)$ keV, and $N_{\rm H} = 0.93(3) \times 10^{22}$ cm^{-2}; we find no evidence for spectral features ($0.5 - 7.0$ keV). We derive a spin period of $P = 6.978977(24)$ s. We have detected emission beyond $4''$ from the central source extending above $100''$, which is due to the supernova remnant (G109.1-1.0) and to dust scattering in the interstellar medium.

CATEGORY: SUPERNOVAE, SUPERNOVA REMNANTS AND ISOLATED NEUTRON STARS