

HST UV observations of the tMSP XSS J12270-4859

L. E. Rivera Sandoval^{1*}, R. Wijnands¹, N. Degenaar¹, J.V. Hernandez Santisteban¹

¹Anton Pannekoek Institute for Astronomy, University of Amsterdam, Science Park 904,
1098 XH Amsterdam, The Netherlands

Transitional millisecond pulsars (tMSP) are the evolutionary link between low mass X-ray binaries and radio millisecond pulsars (MSPs). Up to date only 3 confirmed tMSP are known. Thus, in order to understand these systems we should get as much information as possible using observations at different wavelengths.

In this work we present results of the tMSP XSS J12270-4859 in its pulsar state using the first near and far ultraviolet (UV) images taken with the Hubble Space Telescope (HST). Thanks to the great sensitivity of the HST, these images allow us to study the object in more detail compared to UV images from other telescopes (for instance swift/UVOT or XMM/OM). We have compared the large amplitude variations observed in our UV light curves to those obtained by other authors at different wavelengths in the same state. Previous studies suggest that the optical and infrared emission from this system likely comes from an irradiated companion star without the need of an accretion disk being present. We will discuss whether our UV observations are consistent with this or whether a quiescent accretion disk could still exist.

We have also analyzed some archival and unpublished UV images of the tMSP PSR J1023+0038, also taken in the pulsar state. We carried out a comparison in UV of both tMSPs. We will discuss their similarities and differences, which ultimately help us to understand the evolution of MSPs.

*E-mail: l.e.riverasandoval@uva.nl