

Extreme resonance line profile variations in the ultraviolet spectra of NGC 1624-2: probing the giant magnetosphere of the most strongly magnetized known O-type star

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In this paper, we present high-resolution HST/COS observations of the extreme magnetic O star NGC 1624-2. These represent the first ultraviolet spectra of this archetypal object. We examine the variability of its wind-sensitive resonance lines, comparing it to that of other known magnetic O stars. In particular, the observed variations in the profiles of the CIV and SiIV doublets between low state and high state are the largest observed in any magnetic O-type star, consistent with the expected properties of NGC 1624-2's magnetosphere. We also observe a redshifted absorption component in the low state, a feature not seen in most stars. We present preliminary modelling efforts based on the Analytic Dynamical Magnetosphere (ADM) formalism, demonstrating the necessity of using non-spherically symmetric models to determine wind/magnetospheric properties of magnetic O stars.

Reference: arXiv:1811.10113

Status: Manuscript has been accepted

Weblink: <https://arxiv.org/abs/1811.10113>

Comments: 13 pages, 6 figures, accepted for publication by MNRAS

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