Lyman-alpha Observations of Astrospheres

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On long timescales, the habitability of planets can be affected by stellar winds that can erode or at least alter planetary atmospheres. Understanding these effects requires knowledge of the physical characteristics of stellar winds and how they evolve over the course of a star's lifetime. Unfortunately, studying coronal winds like that of the Sun is very difficult around other stars. The only method of successfully even detecting such winds involves high resolution Hubble Space Telescope (HST) spectra of stellar Lyman-alpha lines, which are sometimes found to have distinctive absorption signatures of astrospheres (i.e., the wind/ISM interaction region). With the assistance of hydrodynamic models of the astrospheres, the amount of astrospheric absorption is a diagnostic of the stellar wind ram pressure, allowing us to make the first measurements of wind strength of many nearby stars. These measurements indicate that young stars generally have winds that are significantly stronger than the current solar wind, increasing the potential impact of solar/stellar winds on planets around Sun-like stars. However, the nature of stellar winds at very young ages of <700 Myr remains uncertain, with some suggestion that such stars may **not** posses very strong winds, in contradiction with the general inverse age/mass-loss correlation seen at later stellar ages. I will not only review past astrospheric observations concerning these issues, but will also discuss very recent HST observations that seek to detect astrospheric absorption from very young solar analog stars, in the hopes of better constraining the nature of winds from such stars.