Using Prominence Mass Inferences in Different Coronal Lines to Obtain the He/H Abundance

Holly Gilbert[1], Gary Kilper[2], David Alexander[2], and Therese Kucera[1]
[1] *NASA Goddard Space Flight Center, Greenbelt, MD 20771, USA*
[2] *Rice University, Dept. of Physics & Astronomy, Houston, TX 77005, USA*

In a previous study we developed a new technique for deriving prominence mass by observing how much coronal radiation in the Fe XII (λ195) spectral line is absorbed by prominence material. In the present work we apply this method, which allows us to consider the effects of both foreground and background radiation in our calculations, to a sample of prominences absorbing in a coronal line that ionizes both H and He ($\lambda < 504$ Å), and a line that ionizes only H (504 Å $< \lambda < 911$ Å). This approach, first suggested by Kucera et al. (1998), permits the determination of the abundance ratio $[\mathrm{He\ I}]/[\mathrm{H\ I}]$ of neutral helium and hydrogen in the prominence. This ratio should depend on how the prominence is formed, on its current thermodynamic state, and on its dynamical evolution. Thus, it may provide useful insights into the formation and evolution of prominences.