Bright points and jets in polar coronal holes observed by the Extreme-ultraviolet Imaging Spectrometer on Hinode

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Abstract. We discuss observations of polar coronal hole bright points made with the Extreme-ultraviolet Imaging Spectrometer (EIS) on the Hinode spacecraft. The data consist of raster images in multiple spectral lines from mostly coronal ions, e.g., $\text{[Fe x]} - \text{[Fe xv]}$. The bright points are observed for short time intervals, and thus the data are snapshots of the bright points recorded during their evolution. The images show a complex unresolved temperature structure (EIS spatial resolution is about $2''$), with the highest temperature being about $2\times10^6 \text{ K}$. Some bright points appear as small unresolved loops with temperatures that are highest near the top. But other bright points appear more point-like with extended structures surrounding them. We discuss a bright point with an associated jet that is bright enough for statistically meaningful measurements. The jet Doppler speed along the line-of-sight is approximately $15-20 \text{ km s}^{-1}$. Electron densities of the bright points and the jet are near $10^9 \text{ cm}^{-3}$, which implies path lengths along the line-of-sight on the order of a few arcsec. We have also constructed differential emission measure curves for two of the best observed bright points. We find that high spatial resolution (significantly better than $1''$) is required to fully resolve the bright point structures.