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A disk-dominated and clumpy circumgalactic medium of the Milky Way seen in X-ray emission using a CubeSat PHILIP KAARET, The University of Iowa, HALOSAT TEAM — The Milky Way galaxy is surrounded by a circumgalactic medium (CGM) that may play a key role in galaxy evolution. The CGM has an ionized component at temperatures near 2 million Kelvin studied primarily in the soft X-ray band. Here we report a survey of the southern Galactic sky with a soft X-ray spectrometer on a CubeSat optimized to study diffuse soft X-ray emission. The X-ray emission is best fit with a disk-like model based on the radial profile of the surface density of molecular hydrogen, a tracer of star formation. This suggests that the X-ray emission is predominantly from hot plasma produced via stellar feedback. Strong variations in the X-ray emission on angular scales of about 10-20 degrees indicate that the CGM is clumpy which is also consistent with stellar feedback. Addition of an extended, and possibly massive, halo component is needed to match the halo density inferred from other observations.

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