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Supplementary information

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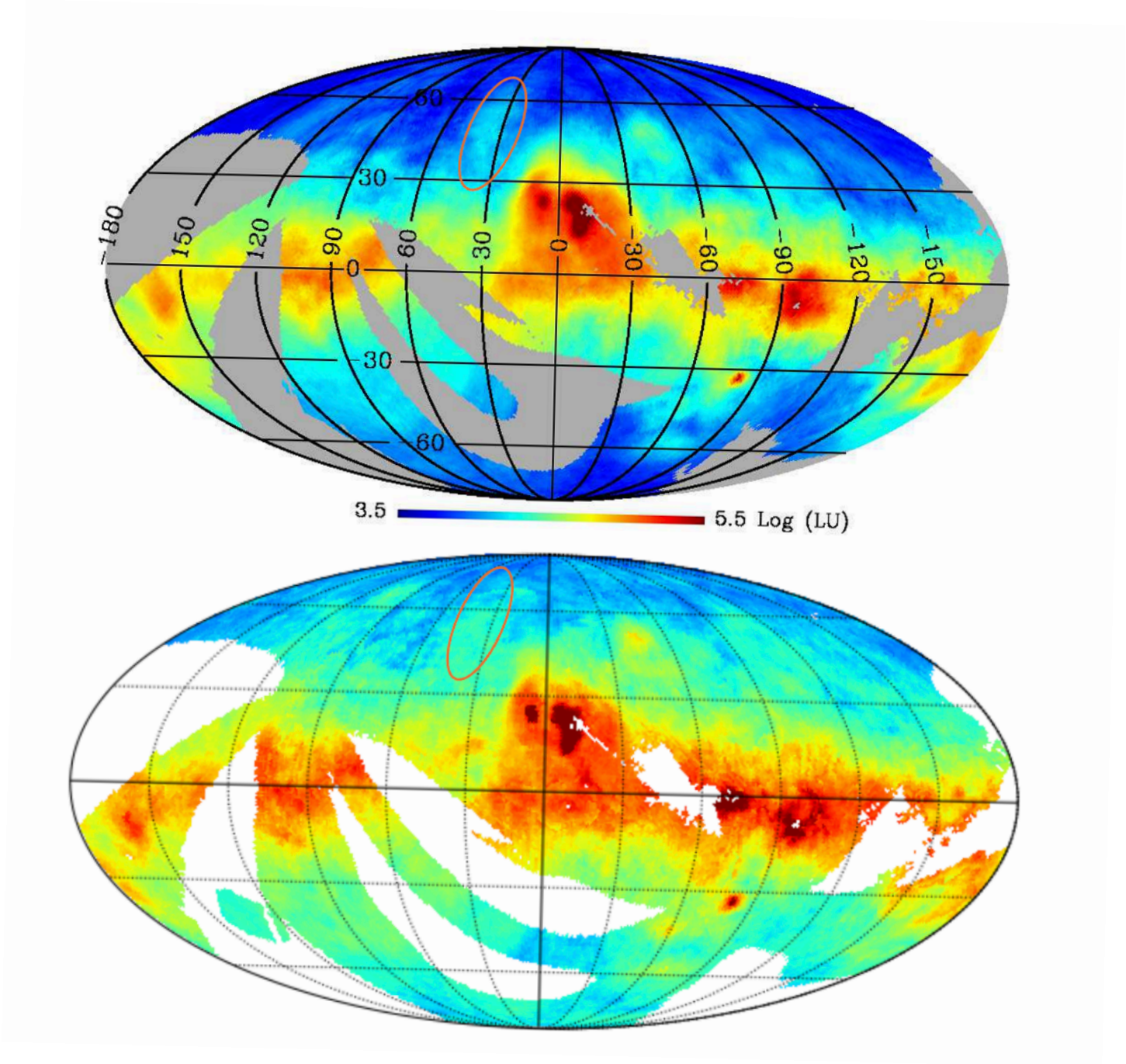
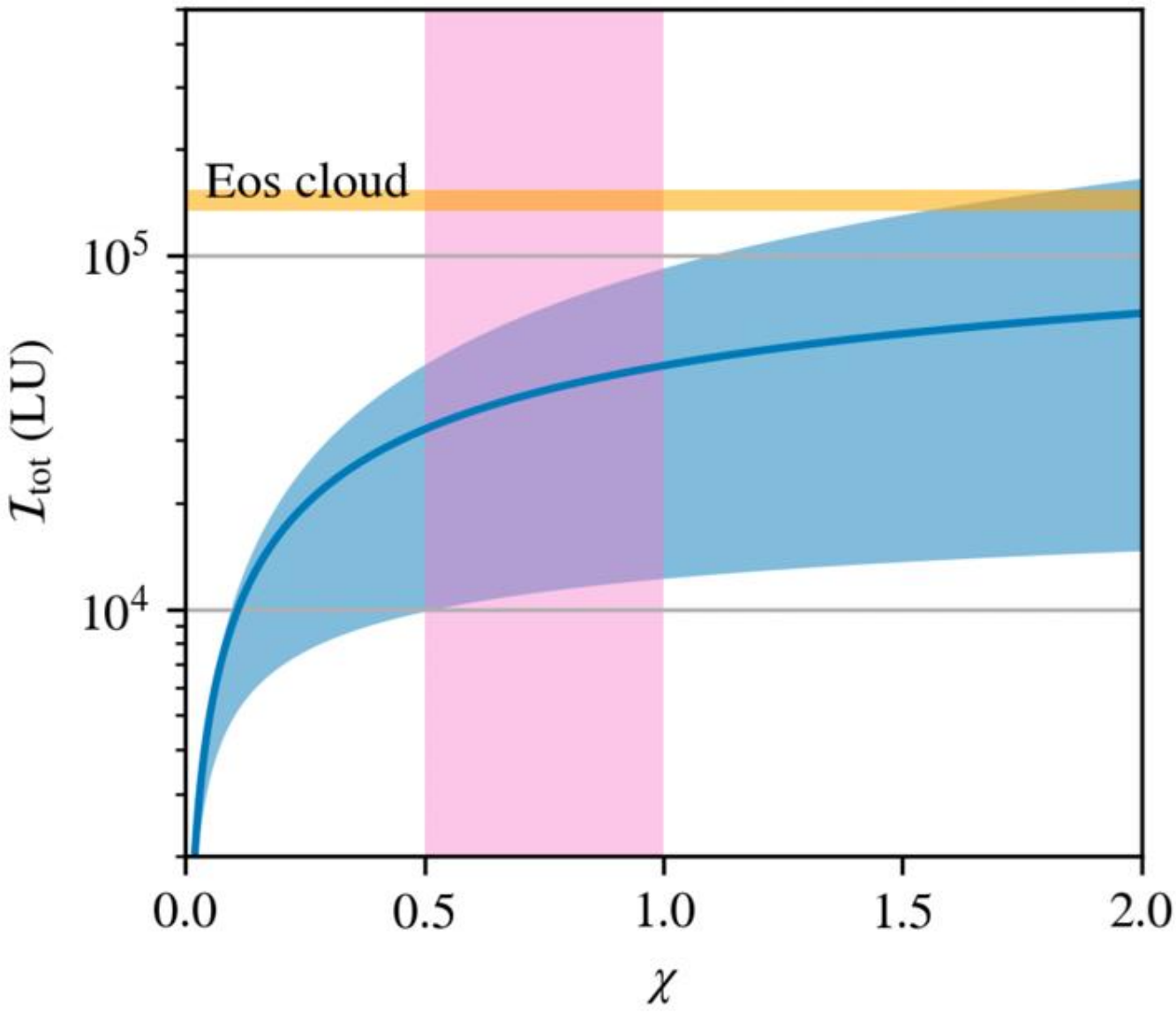
A nearby dark molecular cloud in the Local Bubble revealed via H_2 fluorescence

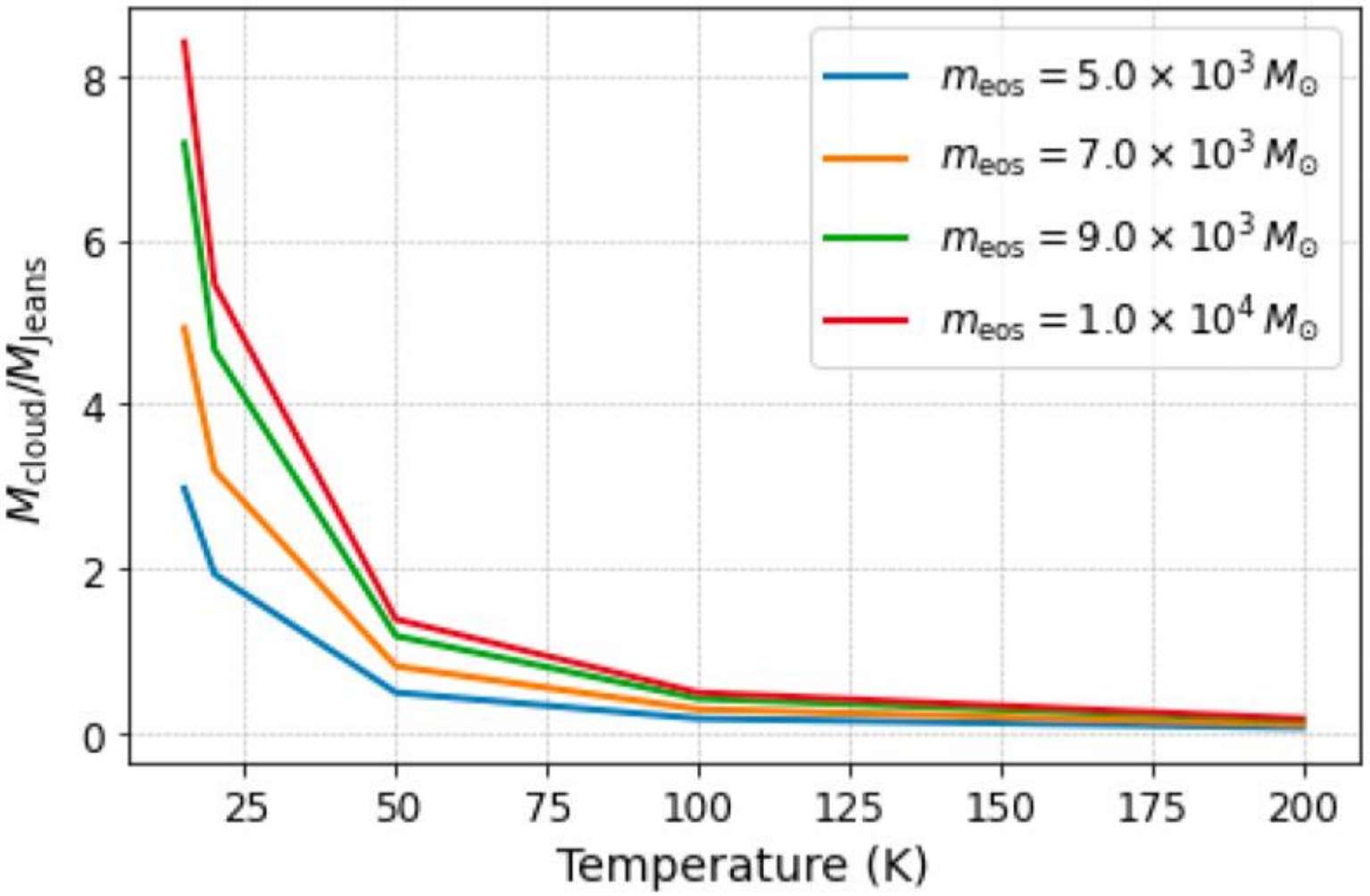
In the format provided by the authors and unedited



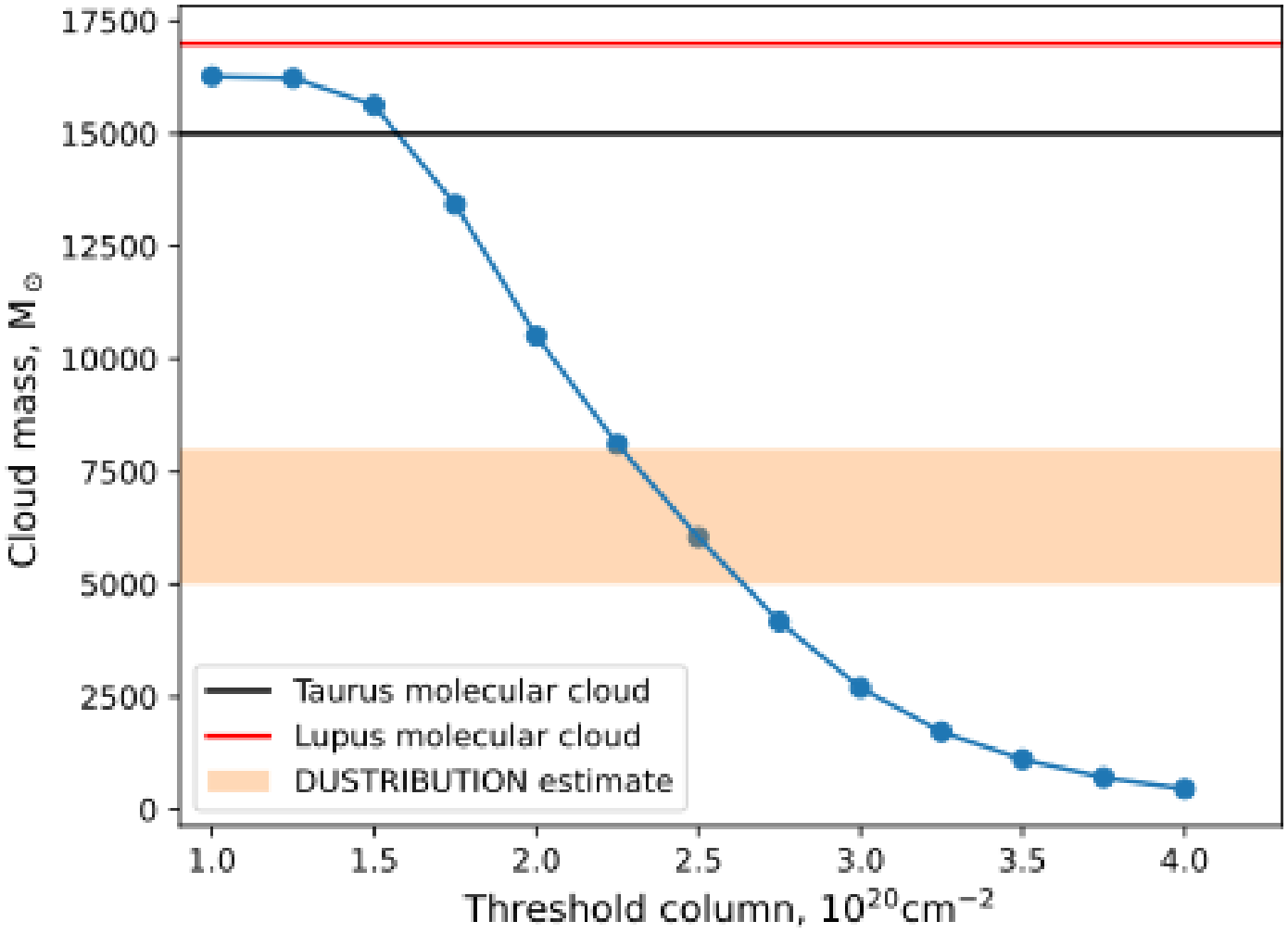
Supplementary Figure 1: All-sky map of H_2 fluorescence with and without the adaptive smoothing method of [13]. We show this in the in the top and bottom panels, respectively. The H_2 fluorescent emission studied here is a robust feature of the data regardless of whether adaptive smoothing is utilized or not.



Supplementary Figure 2: Theoretical predictions of total H_2 line intensity (I_{tot}) as a function of the FUV radiation field intensity (χ) in the steady-state PDR model. The blue curve represents n = 10 cm^{-3} while the shaded region encompasses densities from n = 1 cm^{-3} (lower bound) to n = 100 cm^{-3} (upper bound). The vertical magenta band indicates the expected range of χ values (0.5 to 1) around the standard ISRF. The horizontal orange strip shows the observed total H_2 line intensity for the Eos cloud, I_{tot} = (1.44 ± 0.10) × 10^5 LU. Note the general discrepancy between the model predictions and the observed intensity, suggesting additional excitation mechanisms or non-equilibrium conditions in the Eos cloud.



Supplementary Figure 3: The ratio of cloud mass to Jeans mass (M_{cloud}/M_{Jeans}) as a function of gas temperature for various cloud masses. The masses estimated from 3D dust are between the blue and orange lines the blue/orange lines.



Supplementary Figure 4: Total mass of the Eos cloud as a function of the threshold column density we use to define the cloud boundary. The cloud extent is best captured by a threshold of 2-3 × 10^{20} cm^{-2} and is around half the mass of the Taurus and Lupus molecular clouds.