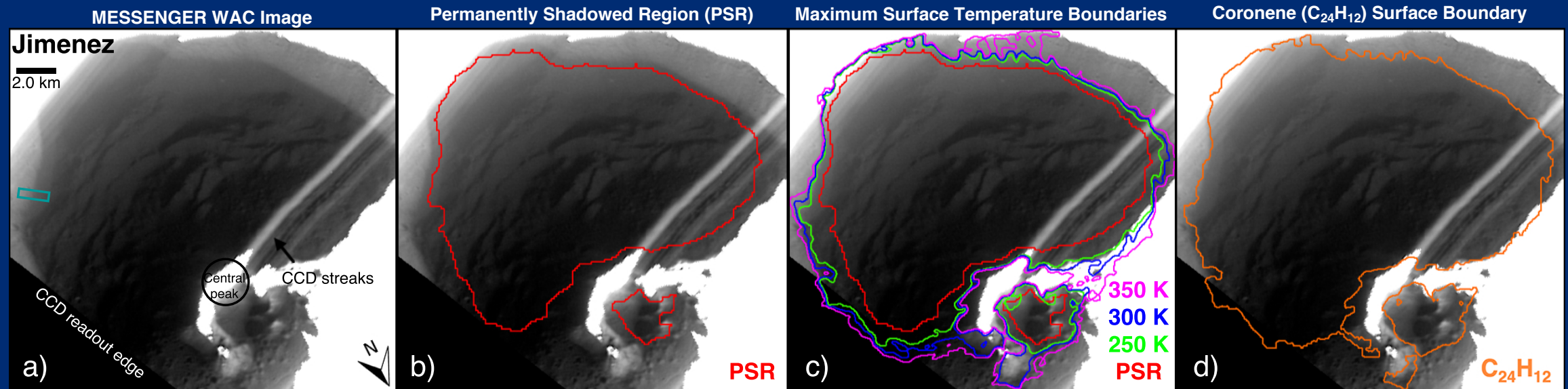


New Illumination and Temperature Constraints of Mercury's Volatile Polar Deposits

- Many of Mercury's polar craters are permanently shadowed and host low-reflectance volatile deposits.
- We used high-resolution (125 m pixel^{-1}) topography models to infer the illumination and thermal conditions of eight northern polar craters ($80\text{-}84^\circ\text{N}$).
- We compared our models to images of Mercury's volatile deposits in order to constrain the brightness variations within the deposits and the boundaries of the deposits.
- The volatile deposits extend outside of permanent shadow to areas with maximum temperatures of $250\text{-}350\text{K}$, consistent with the thermal stability of some organic compounds.



Portions of Mercury's volatile polar deposits are dimly sunlit and experience maximum surface temperatures that are consistent with being comprised of macromolecular organic compounds.