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The Photodissociation and Ionization Fronts in M17-SW Localized with FIFI-LS on Board SOFIA

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To understand star formation rates, studying feedback mechanisms that regulate star formation is necessary. The radiation emitted by nascent massive stars play a significant role in feedback by photodissociating and ionizing their parental molecular clouds. To gain a detailed picture of the physical processes, we mapped the photodissociation region (PDR) M17-SW in several fine-structure and high-J CO lines with FIFI-LS, the far-infrared imaging spectrometer aboard SOFIA. An analysis of the CO and [O I]146 μm line intensities, combined with the far-infrared intensity, allows us to create a density and UV intensity map using a one-dimensional model. The density map reveals a sudden change in the gas density crossing the PDR. The strengths and limits of the model and the locations of the ionization and photodissociation front of the edge-on PDR are discussed.