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Fitting Photonic Doppler Velocimetry Spectrograms with Likelihood Methods PATRICK HARDING, Los Alamos National Laboratory — Photonic Doppler Velocimetry (PDV) spectrograms are most often used to extract the single velocity of a single moving surface as a function of time. However, spectrograms regularly have further features than single surfaces with single velocities, including secondary surfaces, clouds and ejecta, and surface break-up. We will present a method for analyzing PDV spectrograms using likelihood methods which can extract the spectrogram information more accurately and uniformly. We will demonstrate on data that these methods give statistically-valid velocities and velocity uncertainties. We will also show how these methods can be used to derive extractions of complicated surfaces, such as those with ejecta. Finally, we will discuss how these methods can be used directly with models of the expected surface velocity to constrain model parameters, even for complicated observations.

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