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Toward Two-dimensional Velocity Fields in Kiloparsec-scale Quasar Jets[1] DAVID HOUGH, GARETH JONES, Trinity University — An outstanding question in quasar jet physics concerns their velocity fields (Blandford 2008, ASP Conf.Ser. 386, 3). We are investigating this in a sample of 21 3CR lobe-dominated quasars. Complex structures and narrow widths present difficulties not found in smooth, well-resolved radio galaxy jets (Laing and Bridle 2002, MNRAS, 336, 328). We now have a systematic method for distinguishing between compact knots and lower-level inter-knot emission. Application to four sources with prominent knot trains in Bridle et al. (1994, AJ, 108, 766) shows that the first knot is the brightest with a simple Gaussian profile. Succeeding knots are both fainter and have a broad, complex base of associated emission. We will report on analyses of knot vs. inter-knot brightnesses and their implications via Doppler boosting for longitudinal velocity fields. We have also begun investigating transverse velocity fields by convolving trial spine-sheath profiles with the beam. We studied profiles with a fast spine occupying the central one-third, Doppler-dimmed by a factor of two relative to a slower sheath, with these results: a spine of width half a beam yields a convolved profile 30 per cent wider than the beam, while a spine of width one beam leads to a clearly resolved sheath.

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