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Poster

Blob birth and transport in NSTX: GPI data analysis and theory¹ J.R. Myra, D.A. D'Ippolito, D.A. Russell *Lodestar Research Corp.*, D.P. Stotler, S.J. Zweben, *PPPL*, R. Maqueda, *Nova Photonics*, J. Boedo, *UCSD*, T. Munsat, *U. Colorado*, and the NSTX Team – Movies of blobs (i.e. convecting filamentary structures in the scrape-off-layer) taken with the gas-puff-imaging (GPI) diagnostic are used to extract blob parameters: birth zone, scale size, radial velocity v_x and (with DEGAS-2 modeling to infer plasma density and temperature from the He 5876 emission), density and temperature. These measured properties are compared with theory. It is shown that the birth zone and blob parameters are related to the local maximum of the edge $\nabla \ln \langle p \rangle$ suggesting blob generation by an underlying edge instability. The observed blobs are plotted on a theoretical regime diagram,² and mostly lie in the sheath-connected regime. The observed v_x are equal to, or exceed, a minimum velocity scaling predicted by theory. The excess depends on position and is qualitatively consistent with separatrix effects. However, some additional physics not in the present model also influences v_x .

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2. J.R. Myra, D.A. D'Ippolito, Lodestar Report #LRC-05-105, May, 2005.