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3D Blob Theory and Modelling JUSTIN ANGUS, UCSD, MAXIM UMANSKY, Lawrence Livermore National Lab, SERGEI KRASHENINNIKOV, UCSD — Most of the work to date on plasma blobs is limited to 2D theory and simulations which ignore the variation of blob parameters along the magnetic field line. However, 3D features can have an important impact on blob dynamics. For example, if the time scale of the blob motion is on the order of the time scale of unstable drift waves, then drift wave turbulence (DWT) can drastically alter the dynamics of the blob from that predicted by 2D theory. The DWT depletes the density gradients and leads to a much more diffuse blob with reduced radial convection. Furthermore, an initially varying blob density profile along the field line can lead to blob spinning, which reduces the net charge that causes the blob to propagate radially outward. This is similar to the spinning that arises due to a radial temperature profile in 2D sheath connected blobs. Other 3D effects such as parallel flows and ExB shearing are also discussed.

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