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Fourier analysis of bubble dynamics in a wire-array Z pinch implosion[1] EDMUND YU, MICHAEL CUNEO — In the simplest picture of a Z pinch, wires are Ohmically heated and converted into a plasma sheath, which then implodes radially inwards due to the jxB force. Of critical importance is the width of the imploding plasma sheath, since a narrow sheath leads to higher radiated power. Recent simulations and experimental radiography suggest this simple picture is actually quite a bit more complicated. The imploding plasma sheath is an inherently 3D object and constitutes a web-like network of bubbles, on which bubble growth is governed by both the magnetic Rayleigh-Taylor instability as well as jxB forces. An important (but experimentally unknown) parameter affecting the dynamics of the sheath is the degree of azimuthal correlation C, which relates to the average azimuthal extent of each bubble. In this work we perform a Fourier analysis on radiographs generated from 3D simulations to glean information on the time evolution of the dominant (axial and azimuthal) bubble wavelengths, and compare with the corresponding experimental radiographs. This data can help us understand the dynamics of the plasma sheath and constrain the azimuthal correlation C.

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