**INTRODUCTION**

Spatial resolution along slit needed to more accurately measure Y-dependent shock behaviors, including target granularity, nonplanar shock loading, irregular illumination.

Traditional col-by-col Fourier method ill-suited for high spatial resolution, due to uncertainty principle and use of fringes deliberately splayed along Y.

Fourier not well-suited for localization.

Uncertainty principle broadens peaks, entanglement with illum noise increased.

We optimize a row-by-row method toward achieving a spatial resolution FINER than one fringe along Y. We achieve good results with real data and synthetic data.

**METHOD**

New: “sub-wave” analysis produces better spatial resolution than usual “full-wave”

\[
W = (S_2 - S_3) + i(S_1 - S_3)
\]

For ideal data

For non-ideal data

**RESULTS**

Test on NIF data (mild spatial dependence)

Example of (~1/3) sub-wave on NIF data

The rainbow (subwave) phase vs time curve parallels the black curve (fullwave) in right panel set, indicating success.

Test on synth data (severe spatial dependence)

Synthetic data included “speckle noise” or variation in slit illumination.

Slit illum noise freqs similar to science frequencies (can’t simply filter it away).

Post-shock (red) has different apparent period than pre-shock (green) due to Y-dependent physics.

Output: phase

Output: fringes

Input: Synth data