## SUMMARY

## Schlieren refraction imaging could be an informative diagnostic for plasma density profiles in-flight and near stagnation

- The density profile on the inner side of the shell has little effect on a radiograph signal due to integration through two dense shells – refraction mapping can help uncover more detail
- A knife-edge schlieren system can be deployed for measurement of a refraction map - initial testing can take advantage of the existing crystal imaging system on OMEGA EP for diagnostic development
- Two issues that need addressing over a standard radiography system
- the stability of the optical system affects the background and therefore data analysis
- the inhomogeneity of the backlighter spot presents error in the data analysis

## The motivation for a refraction diagnostic is to gain more information about the density profile inside the shell through its first derivative



## Line integral (LI): radiography









### Line integral (LI): radiography d(LI)/dx: AFR or Schlieren (refraction) d<sup>2</sup>(LI)/d*x*<sup>2</sup>: RER/XRPC (shadowgraphy)





AFR: angular filter refractometry

# Schlieren Refraction Imaging for Cryogenic Implosions

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