

# SBS Measurements for Sandia's MagLIF Program

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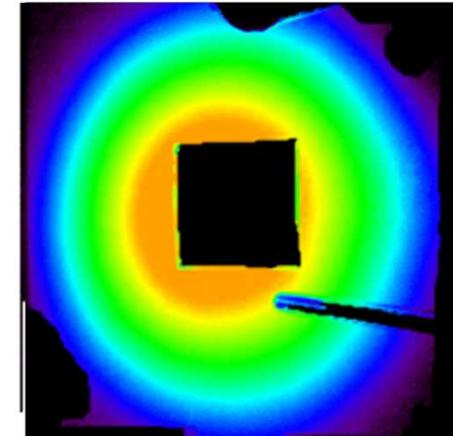
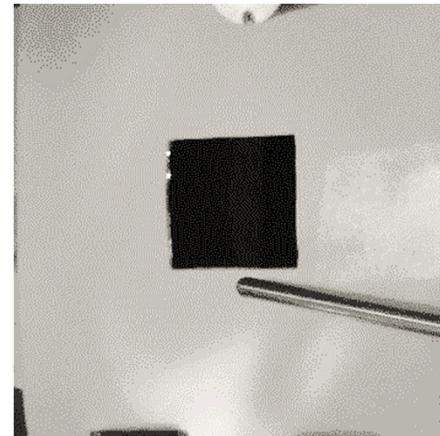
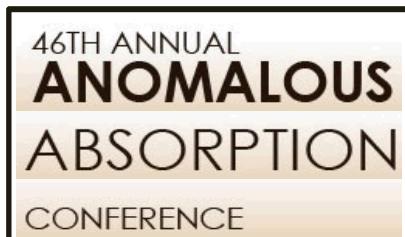
SAND2016-4089C

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in the national interest*

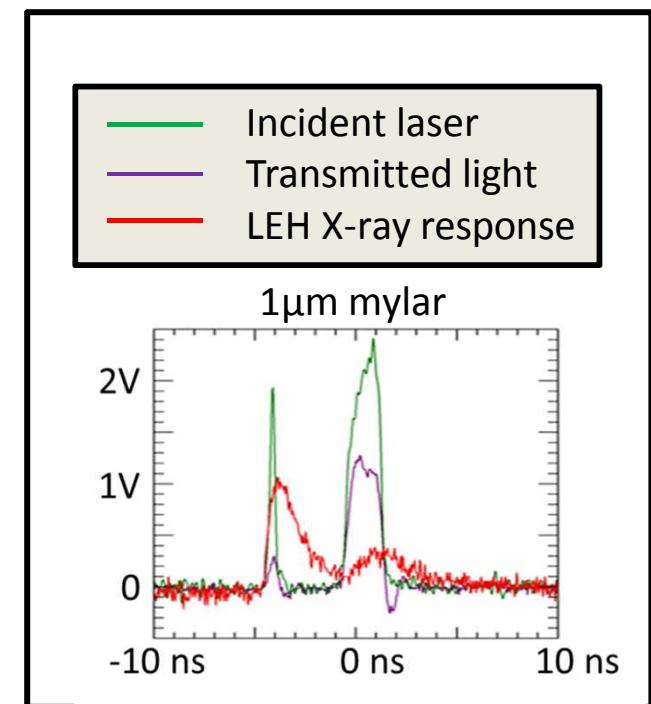
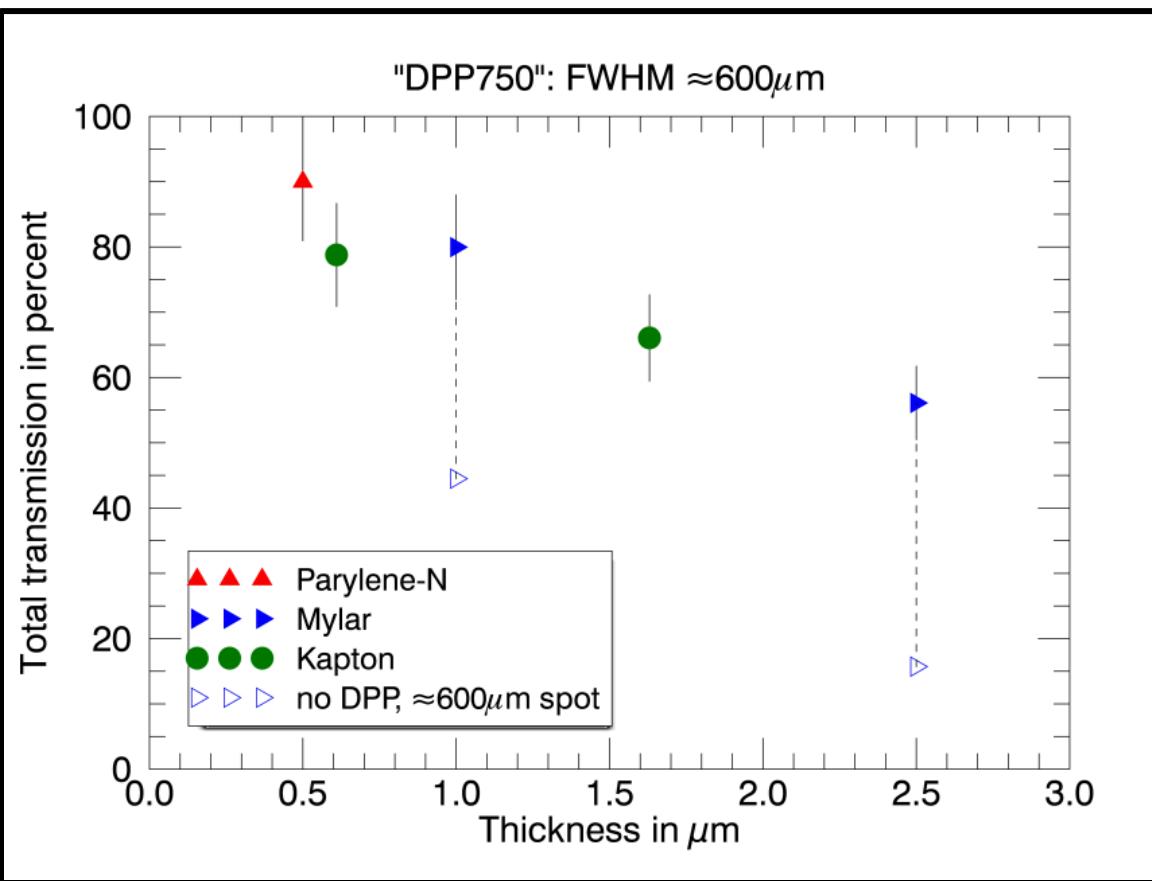
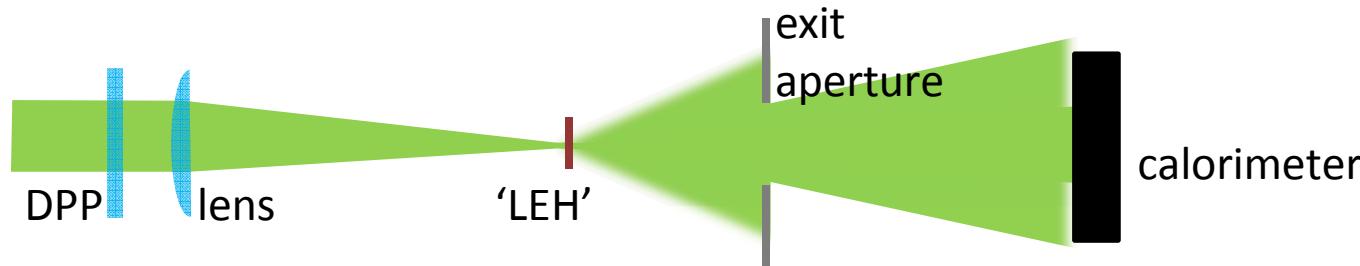


## Sandia National Laboratories

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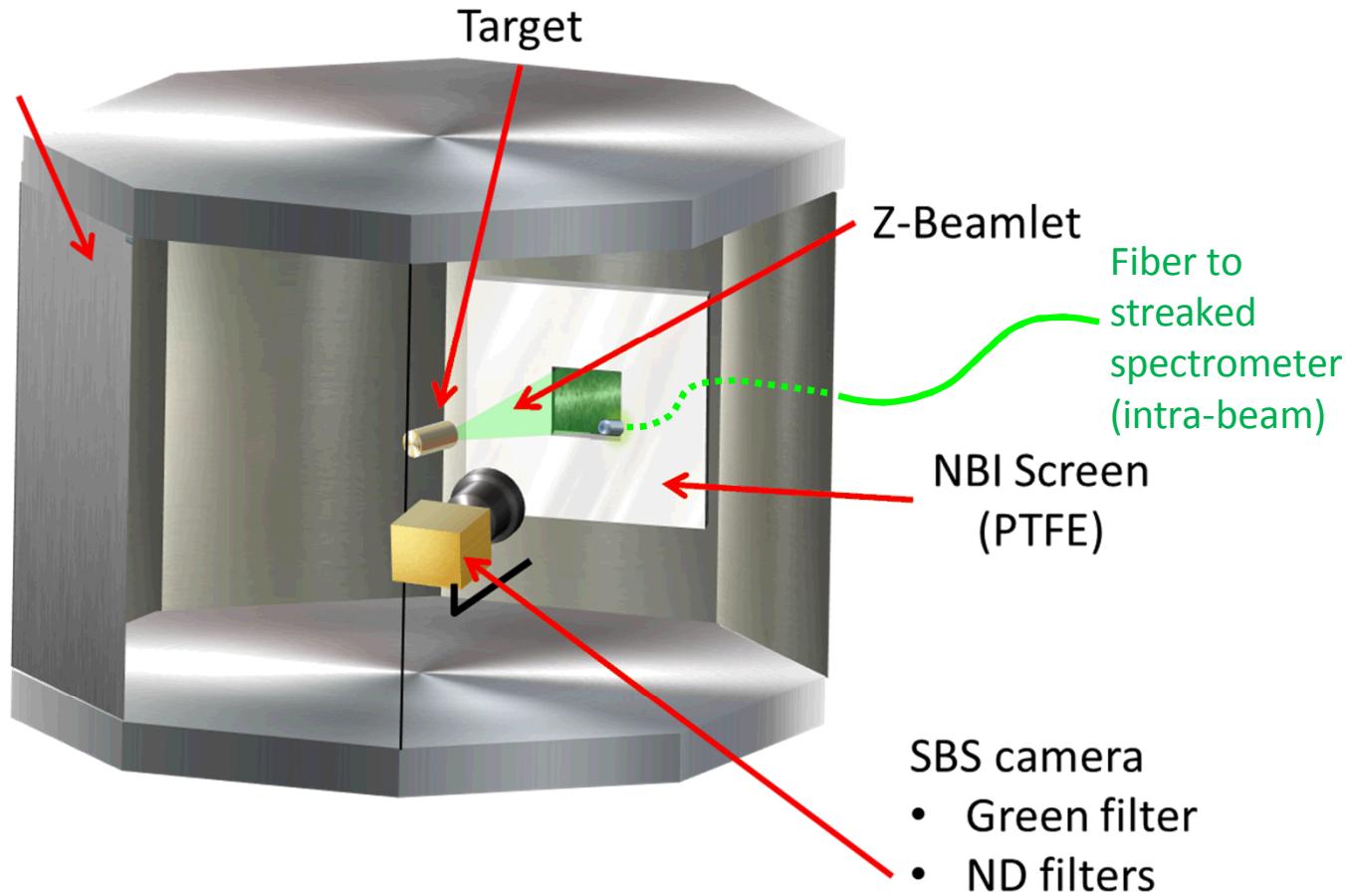
## LEH Transmission with Phase Plate



# SBS Backscatter Measurements

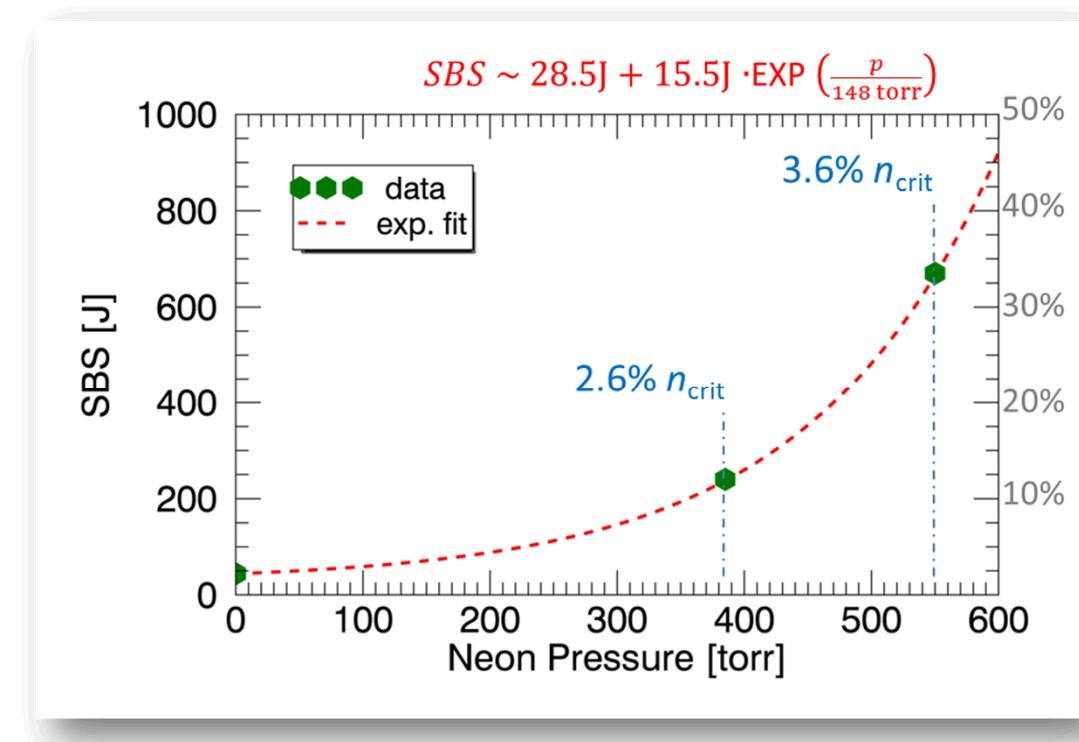
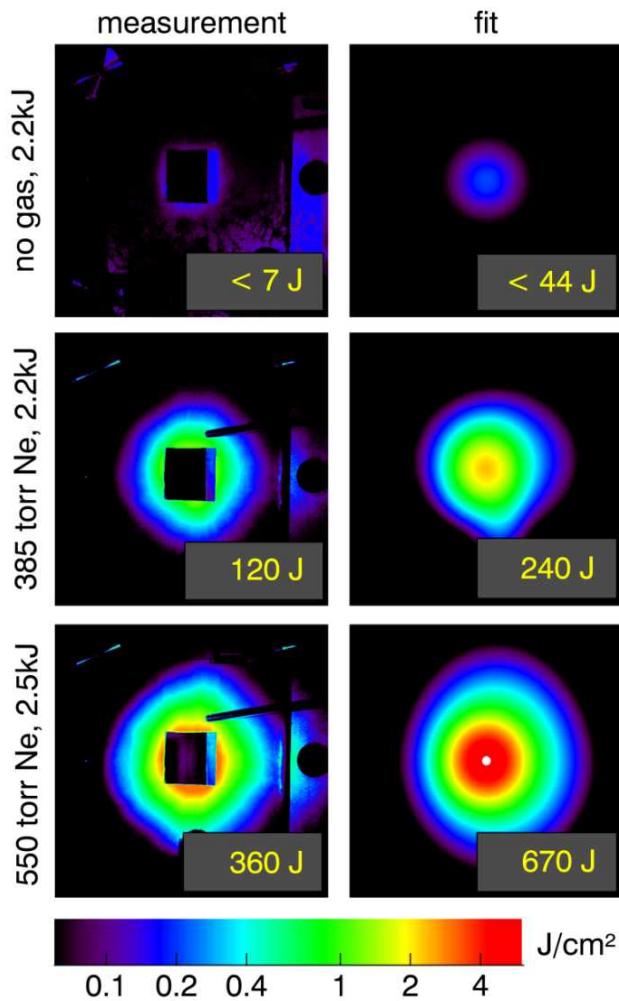
## Setup

Pecos  
target chamber



# SBS Backscatter Measurements

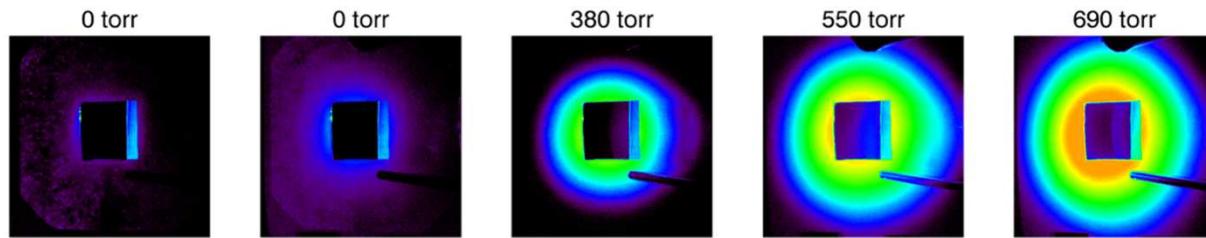
## NEON GAS FILL, No Phase Plate



# SBS Backscatter Measurements

SBS images with  
750 $\mu$ m DPP  
(log-scale)

DATA



FIT

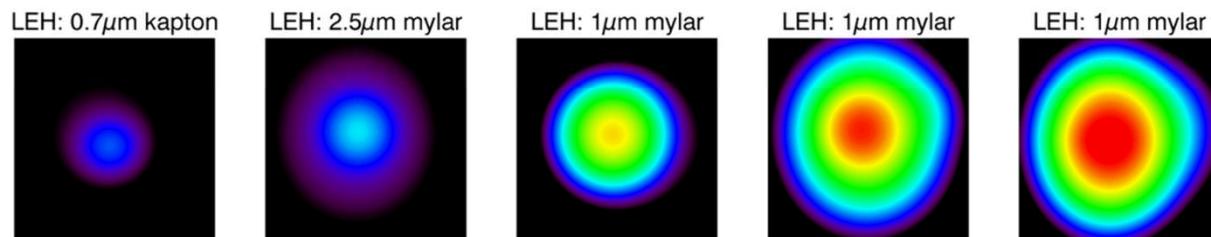
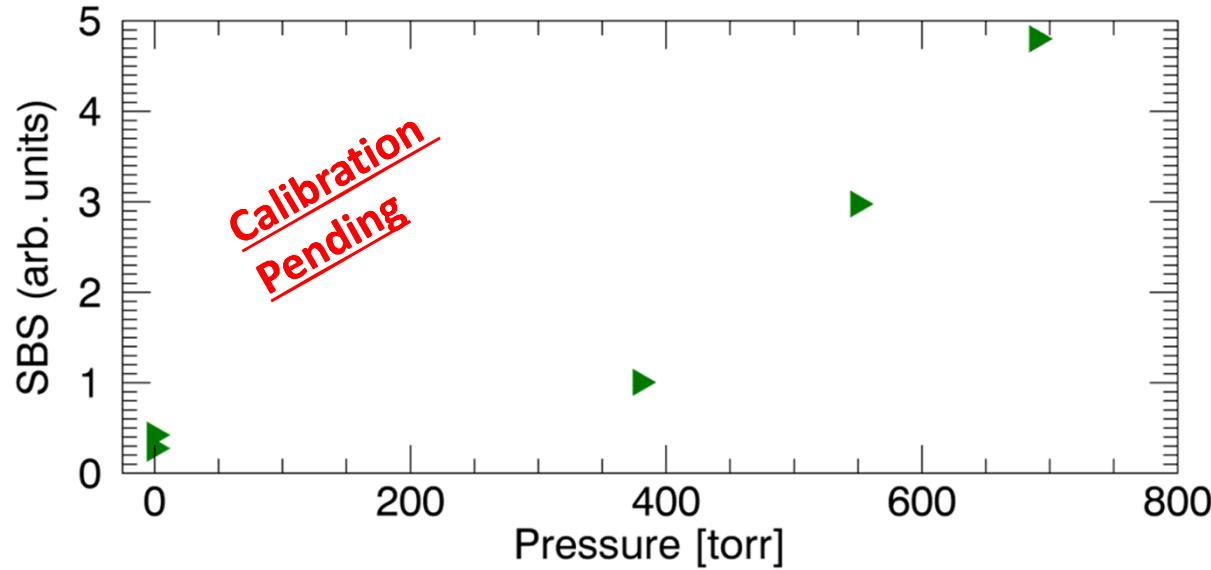
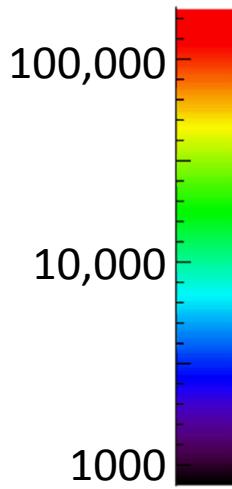
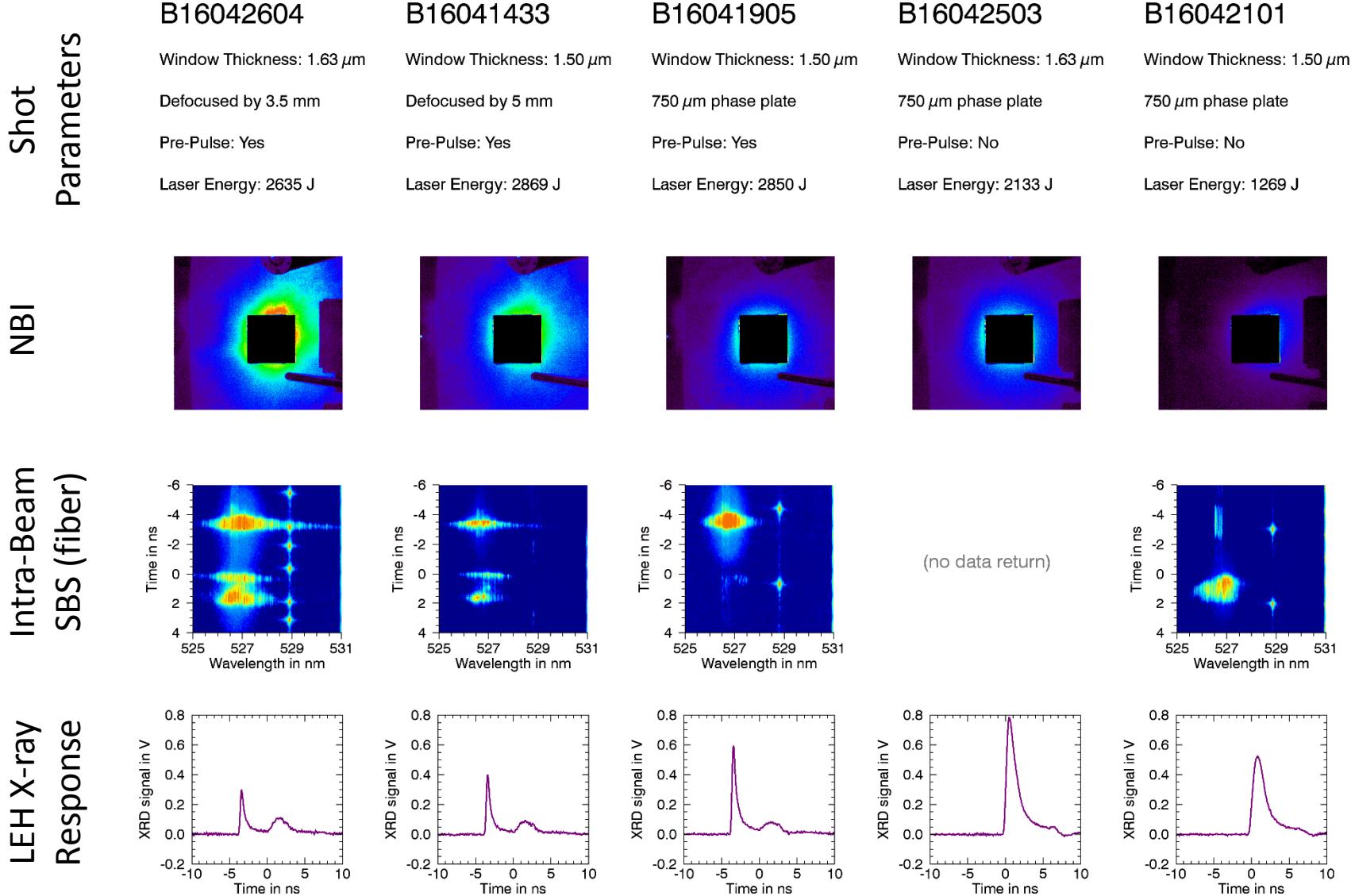


Image Brightness  
(arb. units)





# LEH Window Transmission

## Impact of Pulse Form and Focus

B16041905:

- 750 $\mu$ m DPP
- Pre-pulse
- Energy (total): 2.85 kJ
- Transmission: 1.35 kJ

B16041433

- 5mm defocus
- Pre-pulse
- Energy (total): 2.87 kJ
- Transmission: 1.35 kJ

B16042604

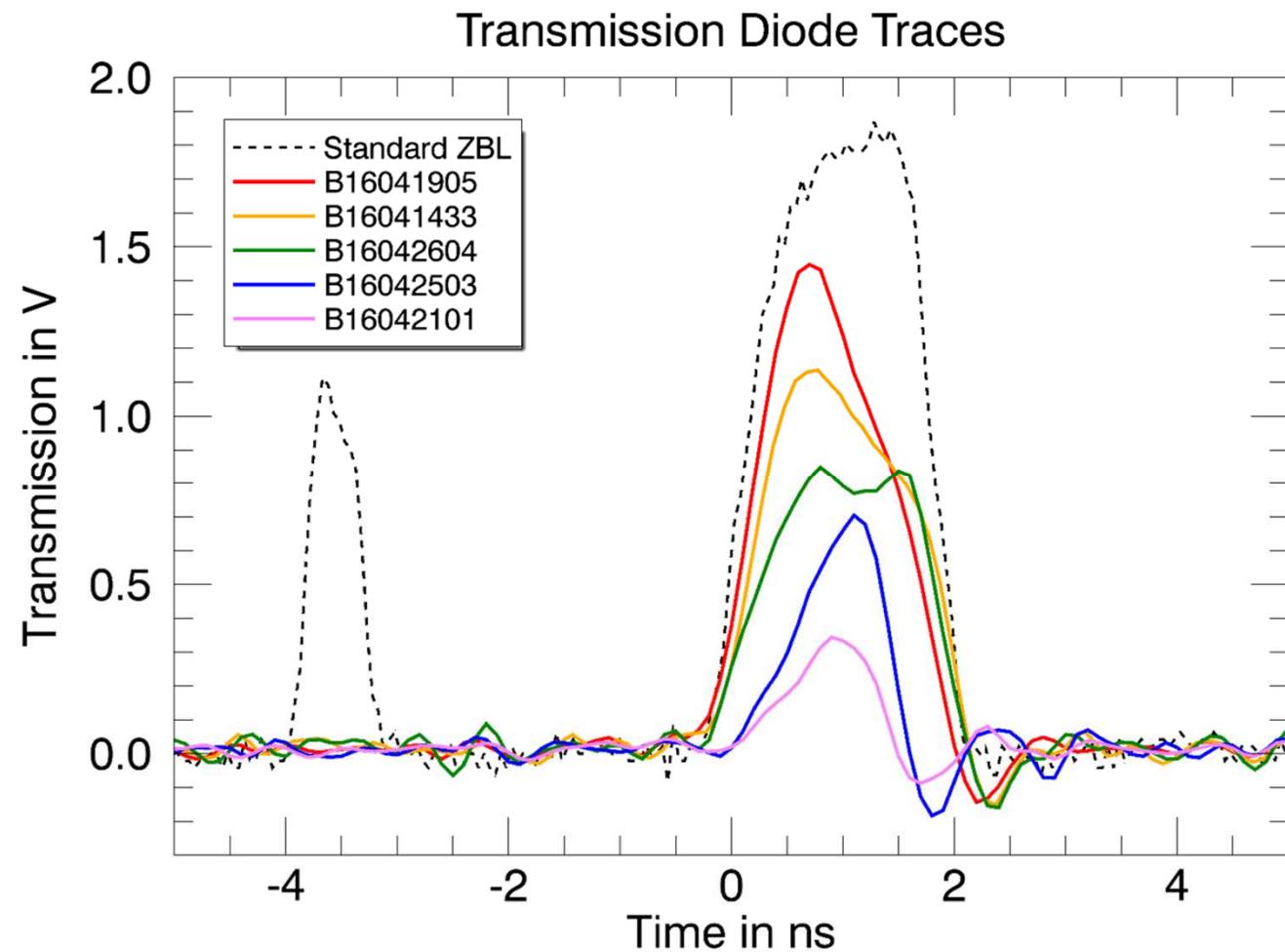
- 3.5mm defocus
- Pre-pulse
- Energy (total): 2.64 kJ
- Transmission: 1.07 kJ

B16042503

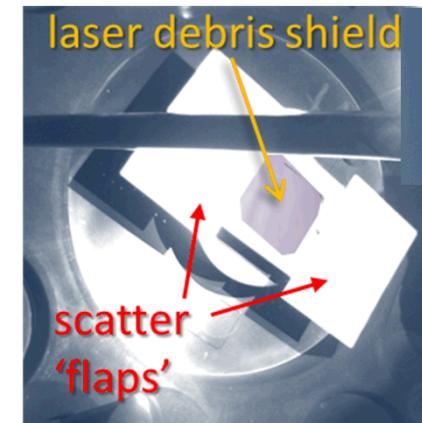
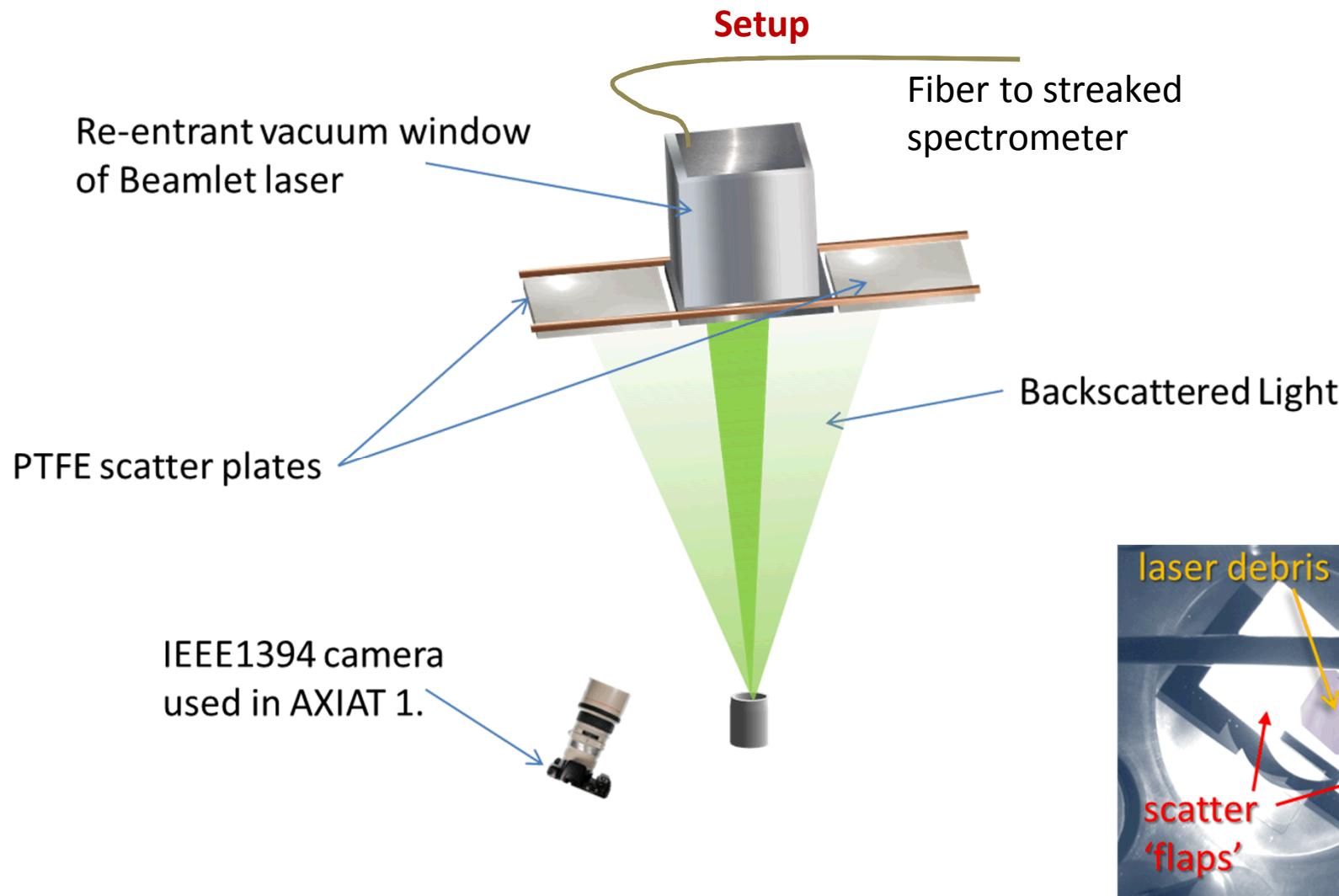
- 750 $\mu$ m DPP
- NO pre-pulse
- Energy: 2.13 kJ
- Transmission: 0.34 kJ

B16042101

- 750 $\mu$ m DPP
- NO pre-pulse
- Energy: 1.27 kJ
- Transmission: 0.14 kJ

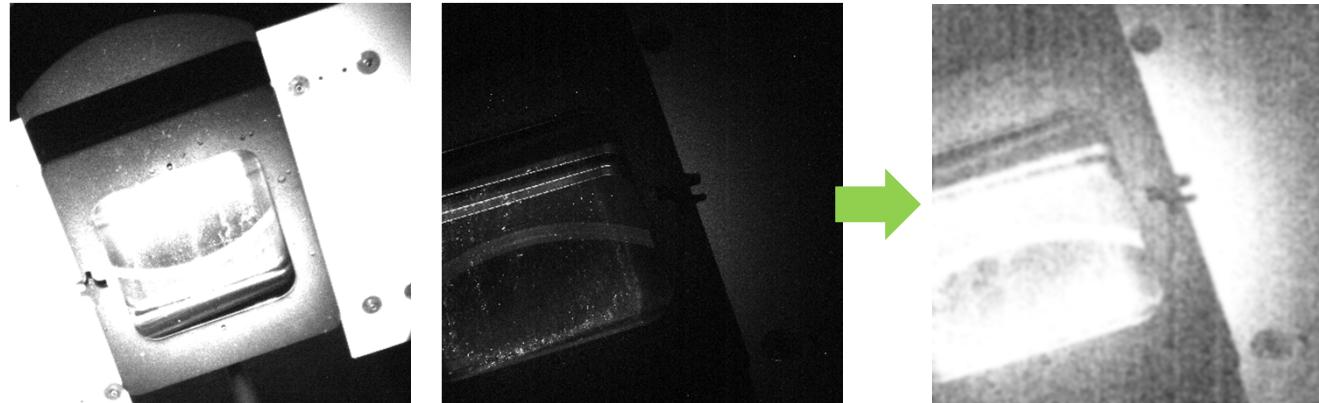


# SBS Backscatter Measurements in Z



# SBS Backscatter Measurements in Z

## Measurements



no phase plate

w/ phase plate

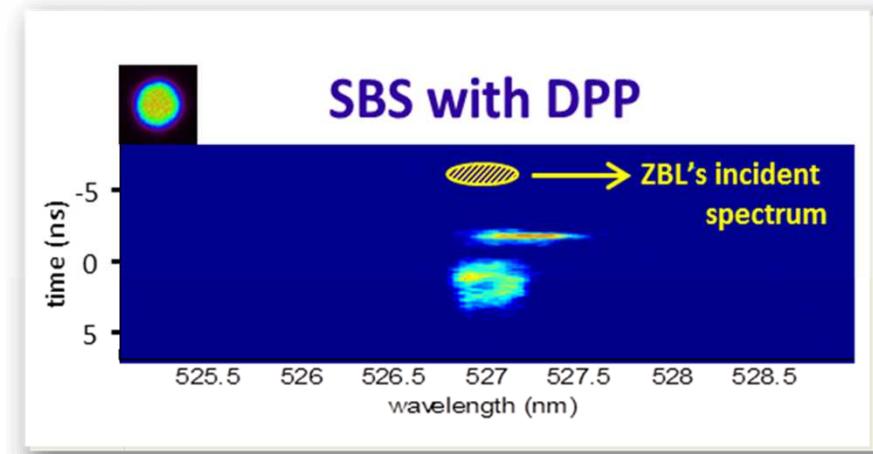
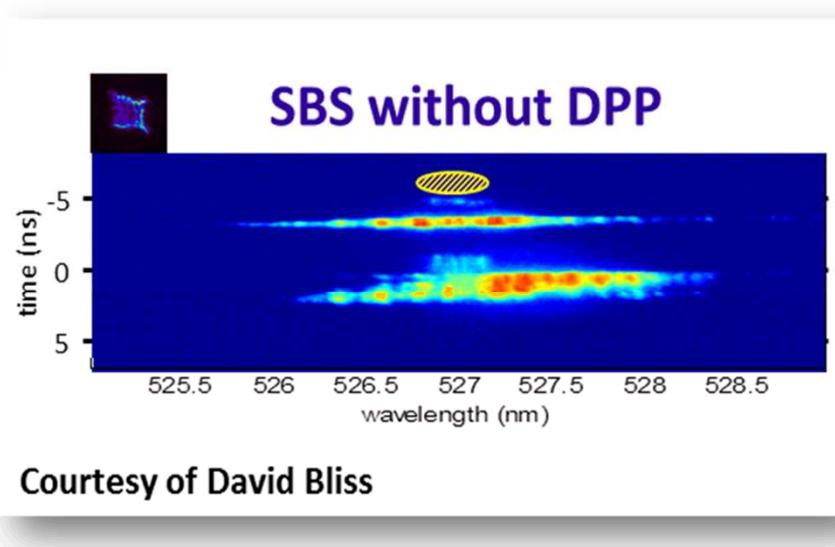
w/ phase plate  
(adjusted brightness)



(Different camera and lens)

# SBS Backscatter Measurements

Temporally and spectrally resolved



Courtesy of David Bliss

**Poor beam quality:**

- More SBS
- Bigger  $\Delta\lambda$  (filamentation)
- Spectral shift

Note: Gas is  $D_2$  (less SBS than  $Ne$ )

- Even with phase plates there seems to be significant LPI in the experiments.
- Much needs to be added for better understanding:
  - NBI diodes
  - Better calibration
  - SRS !!!
- Simulations are in preparation
- We appreciate help and insight into this complex physics challenge.