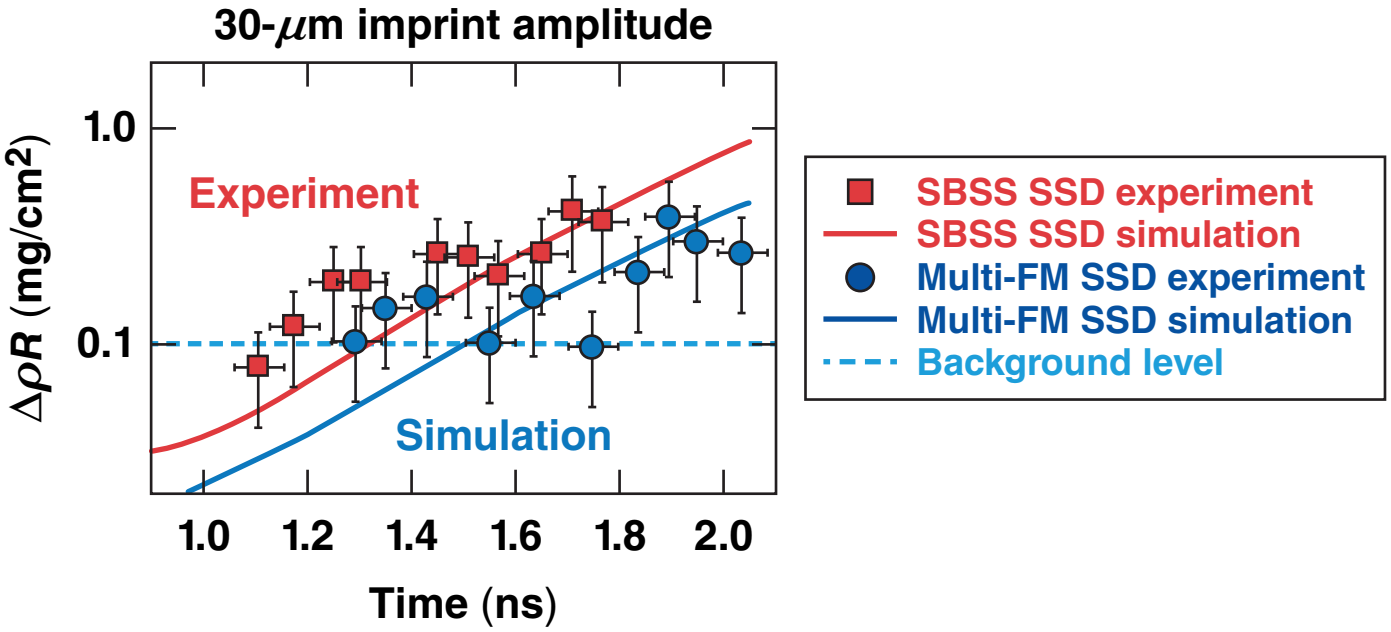
Measurement of 1-D Multi-FM SSD Smoothing Performance on OMEGA EP



M. Hohenberger
University of Rochester
Laboratory for Laser Energetics

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Summary

Imprint reduction with 1-D multi-FM smoothing by spectral dispersion (SSD) has been measured on OMEGA EP

UR LLE

- 1-D multi-FM SSD has been proposed to provide the required single-beam smoothing for polar-drive ignition on the NIF
- Planar-target experiments on OMEGA EP show enhanced reduction of imprint-induced nonuniformities with multi-FM SSD compared to simulated Brillouin scattering suppresion (SBSS) SSD
- The measured imprint reduction from 1-D multi-FM SSD compared to SBSS SSD is in agreement with 2-D *DRACO* simulations*

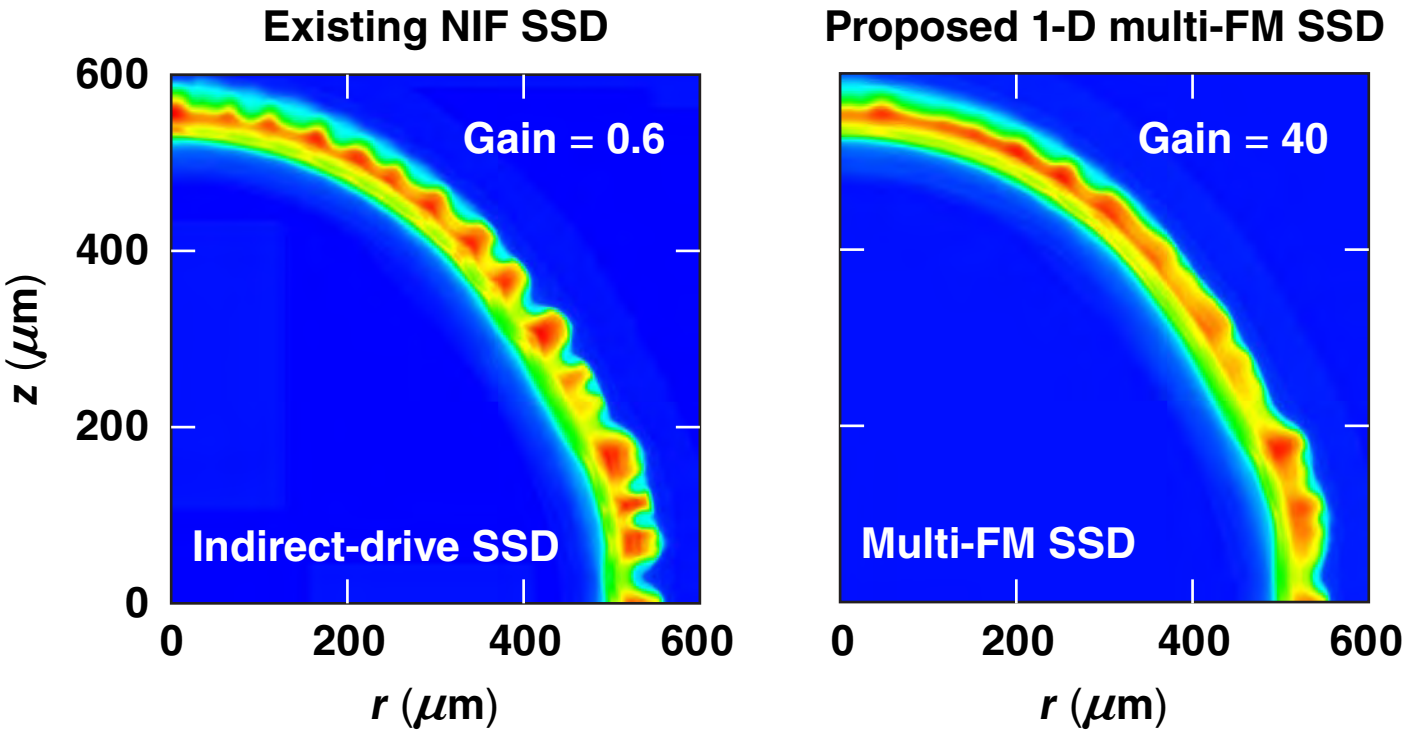
*A. Shvydky *et al.*, YO4.00006, this conference.

Collaborators

A. Shvydky, J. A. Marozas, T. J. B. Collins, D. Canning,
M. J. Bonino, G. Fiksel, T. J. Kessler, P. W. McKenty,
D. D. Meyerhofer, J. D. Zuegel, and T. C. Sangster

University of Rochester
Laboratory for Laser Energetics

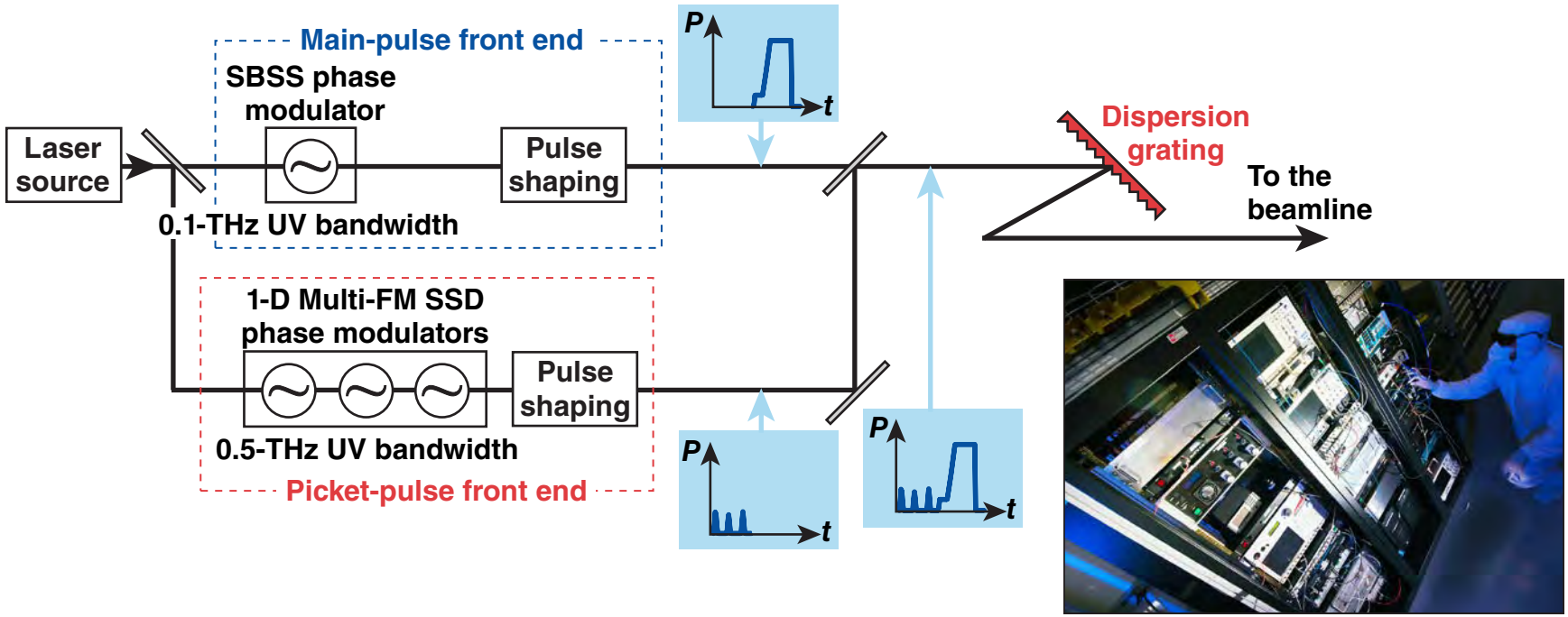
Multi-FM 1-D SSD is essential for polar-drive ignition on the NIF*



*T. J. B.Collins *et al.*, Phys. Plasmas 19, 056308 (2012).

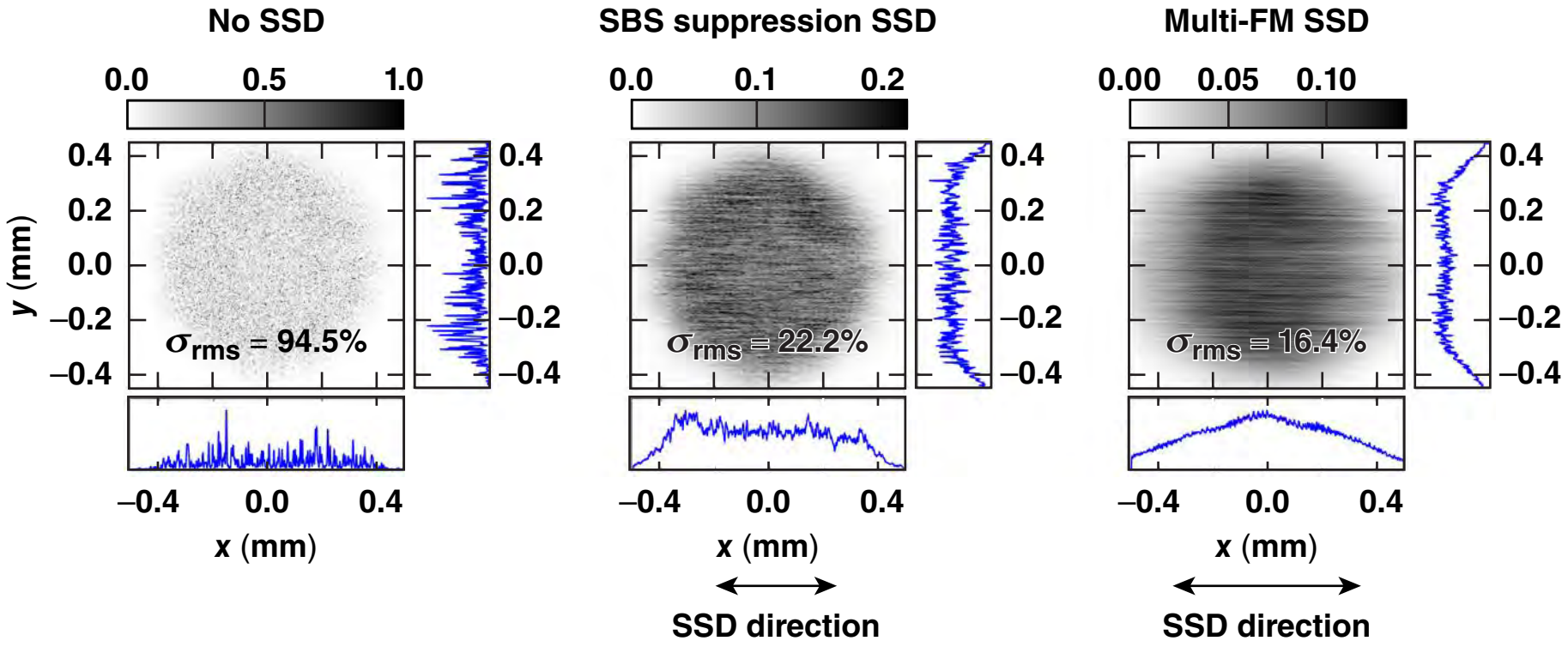
TC9842c

A NIF preamplifier module (PAM) is installed at the front end of OMEGA EP Beam 4 and can be operated with either SBSS SSD or multi-FM SSD



TC9853e

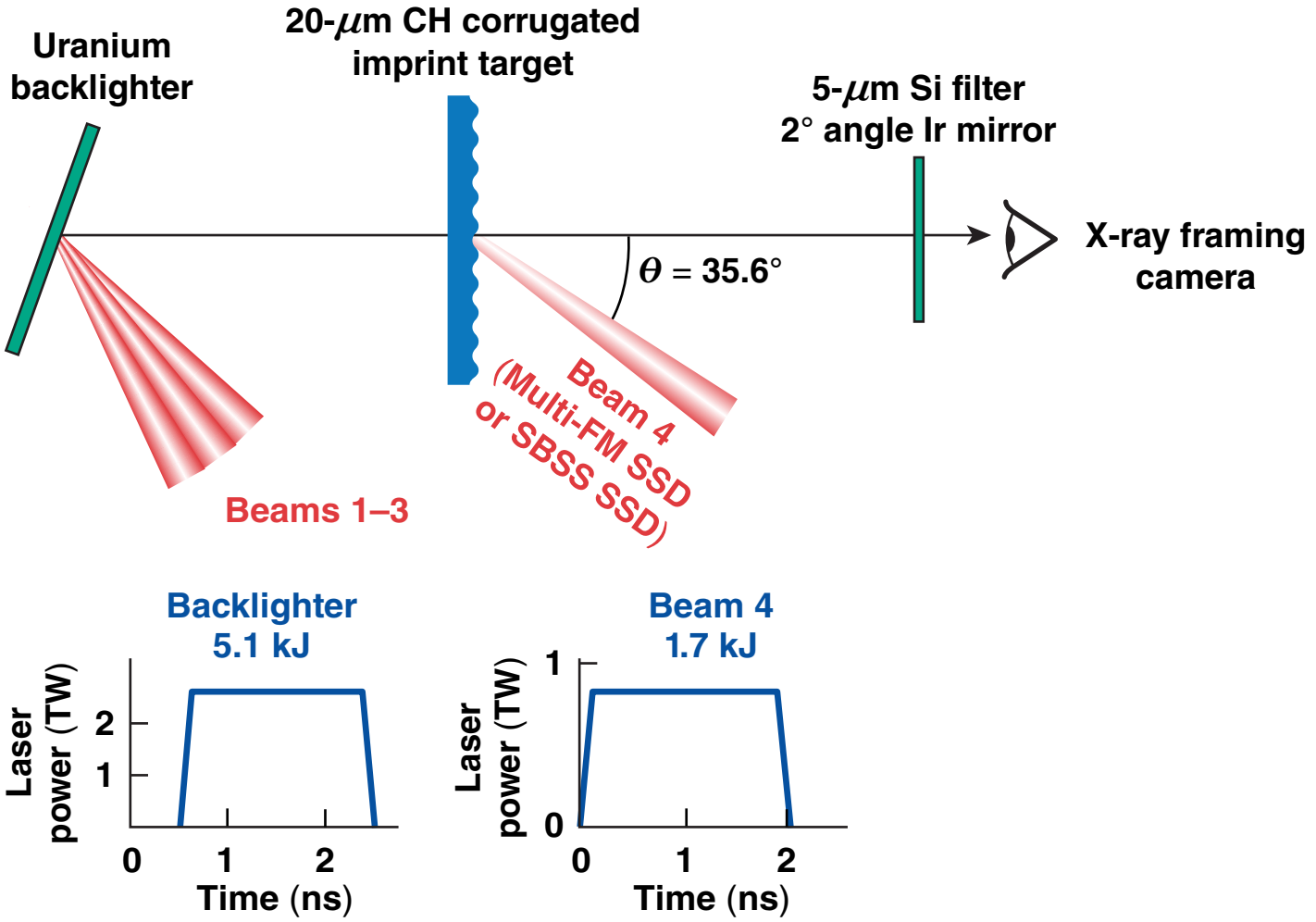
High-magnification equivalent-target-plane focal-spot images show smoothing caused by SBSS and multi-FM SSD



- Speckle pattern is displaced in the SSD active direction (horizontal)
- Increased smoothing performance for multi-FM compared to SBSS SSD

TC10827a

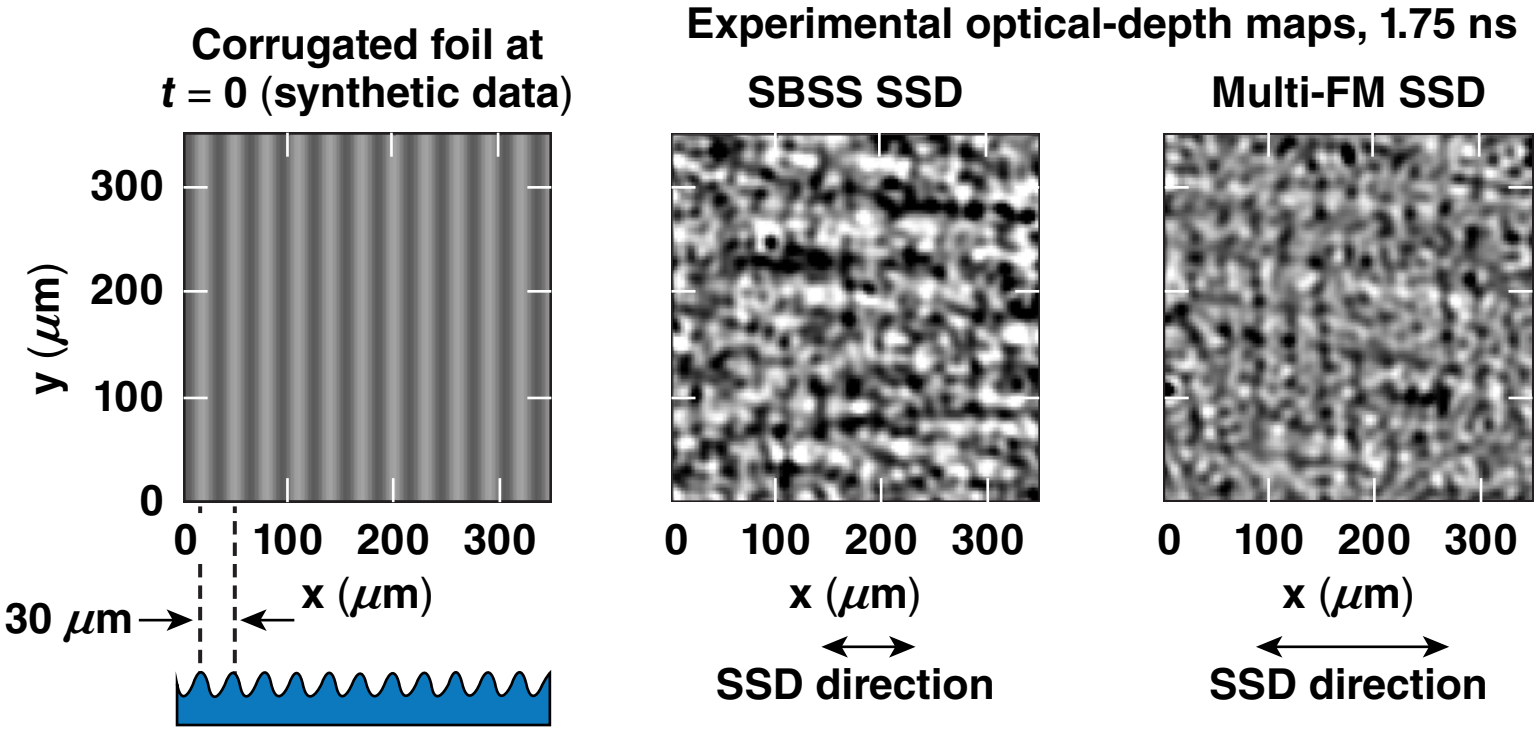
Multi-FM smoothing performance is measured experimentally in planar-foil, Rayleigh–Taylor (RT) growth experiments*



*T. R. Boehly *et al.*, Phys. Plasmas 8, 2331 (2001).

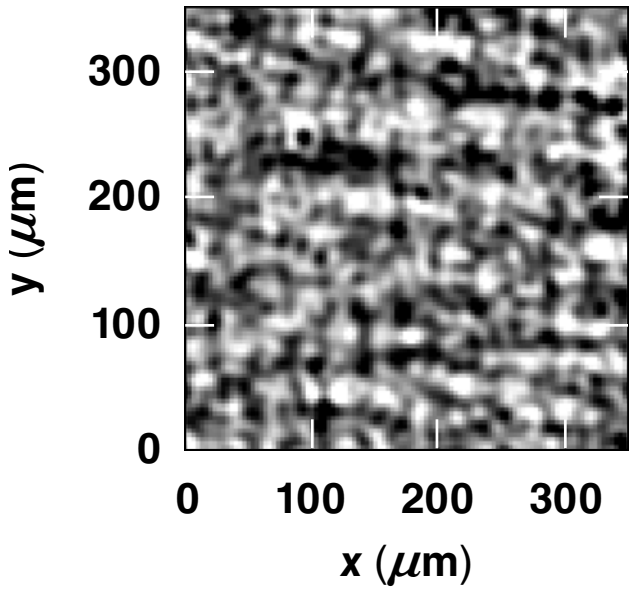
TC9843f

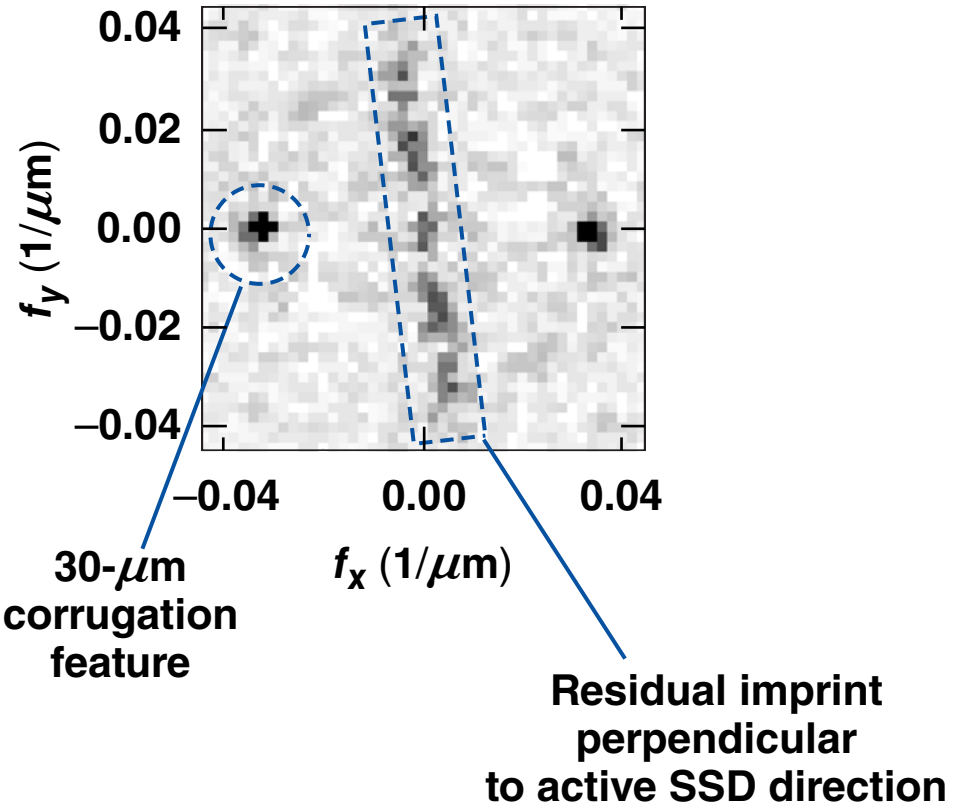
Framing-camera images show reduced target optical-depth (OD) variations for multi-FM smoothed target interactions



E22611

The framing-camera data are analyzed in frequency space to extract imprint and corrugation-seeded RT amplitudes

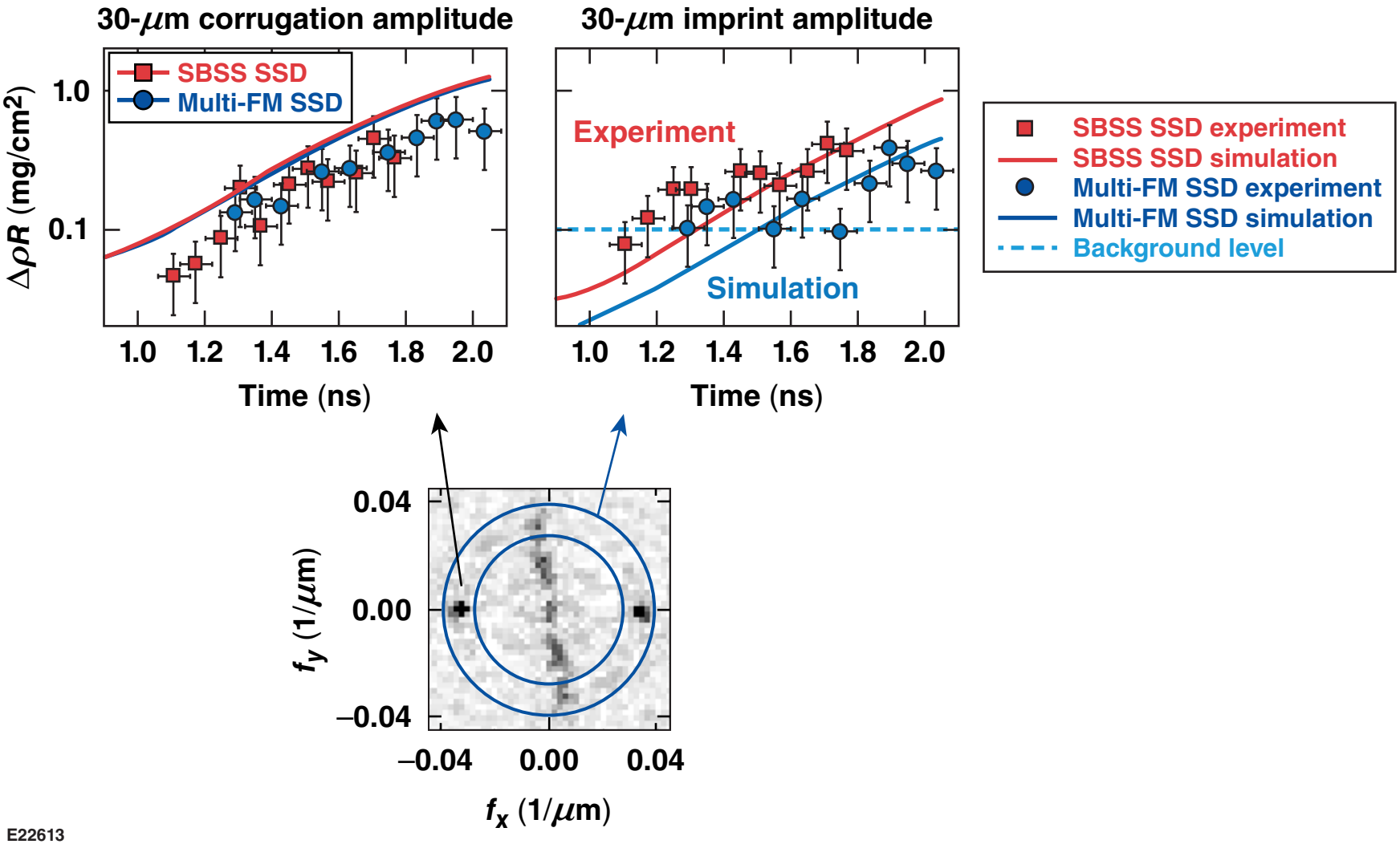




- Fast-Fourier-transform (FFT) data show 30-μm corrugation signature and preferential imprint growth perpendicular to the 1-D SSD active direction

E22612

The experimental corrugation growth is unaffected by the SSD method; the broadband amplitude is reduced with multi-FM SSD



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Summary/Conclusions

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