

Abstract Submitted  
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**High repetition rate experimental techniques at the Extreme Light Laboratory at AFRL**<sup>1</sup> JOHN MORRISON, KEVIN GEORGE, Innovative Scientific Solutions, Inc., SCOTT FEISTER, California State University Channel Islands, JOSEPH SNYDER, Miami University, JOSEPH SMITH, The Ohio State University, GREGORY NGIRMANG, AFRL/NRC, WES ERBSEN, KYLE FRISCHE, ADAM KLIM, Innovative Scientific Solutions, Inc., CHRIS ORBAN, orban@physics.osu.edu, ENAM CHOWDHURY, The Ohio State University, MEL ROQUEMORE, AFRL — As ultra-intense lasers transition to a high repetition rate (1-10 Hz) mode of operation, experimental techniques must also adapt to meet the new challenges of complementary experimental design, targetry, and detectors. At the Extreme Light Laboratory at AFRL, we perform relativistically intense laser-plasma interaction experiments at 1 kHz repetition rate. In this poster we present novel, optically synchronized pump-probe techniques well matched to high repetition rate operation. Self-refreshing, liquid microjet-based targets are capable of generating submicron thick sheets and can be applied at repetition rates exceeding 10 kHz. In order to diagnose the energetic particle spectra we design custom digitized particle spectrometers to provide real time experimental feedback.

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