Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Detecting SARS-CoV-2 in Droplets by Mass Spectrometry and Imaging with High Power Lasers[1] T. SCHENKEL, T. OSTERMAYR, A. PERSAUD, J. VAN TILBORG, S. STEINKE, H.-E. TSAI, L. OBST-HUEBL, A. SNIJDERS, E. BLAKELY, J.-H. MAO, Q. JI, C.G.R. GEDDES, C. SCHROEDER, P. SEIDL, E. ESAREY, Lawrence Berkeley National Laboratory — SARS-CoV-2 appears to be primarily transmitted via droplets of different sizes causing COVID-19. We report on recently commenced studies of SARS-CoV-2 in droplets where we use high power, short laser pulses to induce fragmentation and ionization of virus-laden droplets, combined with betatron x-ray imaging. Our goal is to collect ion spectra and to correlate them with images to reconstruct the microenvironment of their origin for a series of droplet compositions. If we are successful in detecting fingerprint ions then this can be used as a diagnostic tool for rapid identification of SARS-CoV-2 in biological specimen, including saliva, nasopharyngeal swabs and tracheal aspirates. In addition, this approach can identify biochemical targets to decrease viral viability by modifying the microenvironment of SARS-CoV-2-laden droplets limiting the spread of COVID-19.

[1]The work is supported by an LDRD and by the U.S. Department of Energy, Office of Science, under Contract No. DE-AC02-05CH11231.

Thomas Schenkel
Lawrence Berkeley National Laboratory

Date submitted: 10 Jul 2020 Electronic form version 1.4