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Holographic microrheology of biofilms FOOK CHIONG CHEONG, SIMONE DUARTE, DAVID GRIER, New York University — We present microrheological measurements of polymeric matrices, including the extra-cellular polysaccharide gel synthesized by the dental pathogen S. mutans. As part of this study, we introduce the use of precision three-dimensional particle tracking based on video holographic microscopy. This technique offers nanometer-scale resolution at video rates, thereby providing detailed information on the gels' complex viscoelastic moduli, including insights into their heterogeneity. The particular application to dental biofilms complements previous studies based on macroscopic rheology, and demonstrates the utility of holographic microrheology for soft-matter physics and biomedical research.

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