

## Using Optical Metrology to Reconstruct Sound Recordings

Presenter: Vitaliy Fadeyev

Lawrence Berkeley Lab: E.W.Cornell, V.Fadeyev, C.Haber, J.Jin, R.Nordmeyer  
Un-affiliated: Mitch Golden

Invited oral presentation

Prior to 1950 nearly all sound recordings were made on mechanical media such as wax, foil, shellac, lacquer, and plastic. Some of these older recordings contain material of great historical value or interest but are damaged, decaying, or now considered too delicate to play. Archives seek to preserve and also create broad access to their collections.

An ongoing effort at Berkeley Lab has applied methods of optical metrology and image processing to reconstruct sound stored on these mechanical carriers. This approach was inspired by the use of precision optical metrology to align and fabricate silicon tracking arrays for high energy physics experiments and by track finding and fitting data analysis methods. The technology has matured to the point that an optical metrology system for sound restoration has been designed and built for the Library of Congress. Results on this and on studies of historical recordings will be presented.