

Layered Materials for Photocathode Emission

Joshua T. Paul, Michael Ashton, Siddharth Karkare, Richard G. Hennig (U. Florida)

RF Breakdown Rates in Cryogenic Copper Accelerators

Alexander D Cahill, James B Rosenzweig, Sami Tantawi, Valery Dolgashev

Study of the Viability of a One-Dimensional Sextupole Transformation Lattice
Lipi Gupta, Stanislav Baturin, Young-Kee Kim

Transverse bunch dynamics with wake field interaction
Stanislav Baturin, Young-Kee Kim

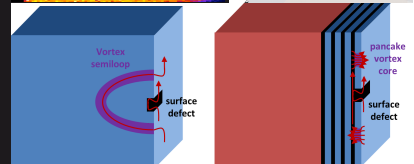
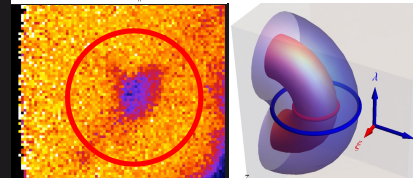
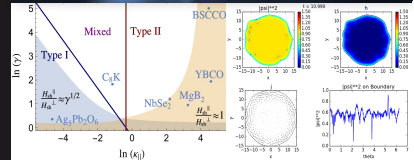
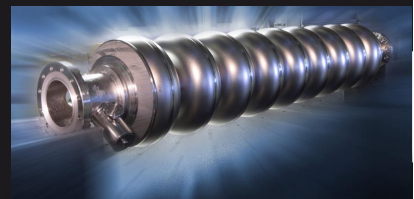
**Theoretical estimates of maximum fields in SRF cavities:
Stability theory, disorder, and laminates**

Danilo Liarte, Daniel Hall, Sam Posen, Mark Transtrum, Matthias Liepe, James Sethna

***THEORETICAL
ESTIMATES OF
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FIELDS IN SRF
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Stability theory, disorder, and laminates

Danilo Liarte, Daniel Hall, Alden Pack, Sam Posen, Mark Transtrum, Matthias Liepe, James Sethna



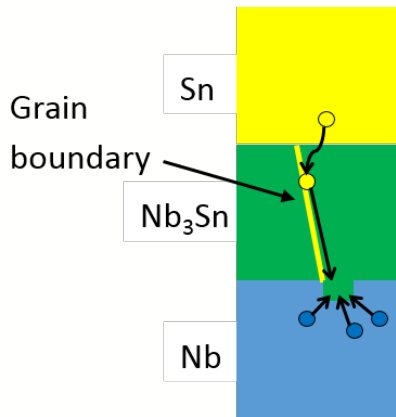


Features of Nb₃Sn cavity surfaces

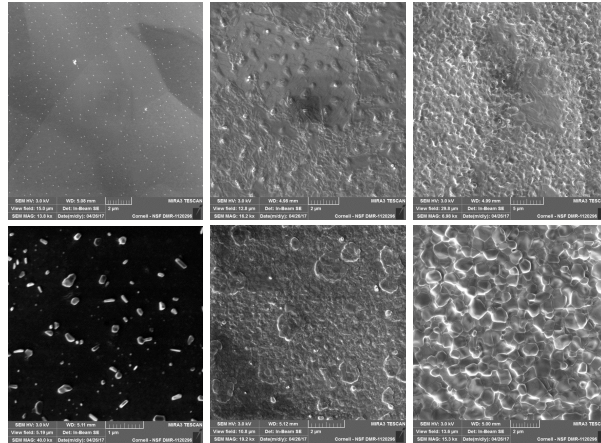


Surface analysis of features seen on Nb₃Sn sample coupons grown by vapour diffusion

D.L. Hall, T. Arias, P. Cueva, M. Liepe, J.T. Maniscalco, D.A. Muller, R.D. Porter, N. Sitaraman



Not pre-anodised



Pre-anodised

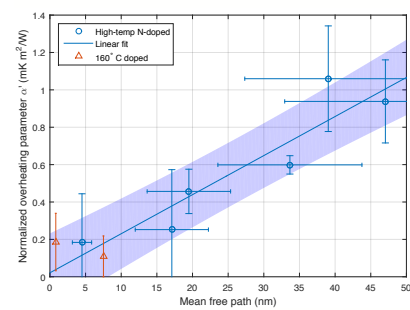
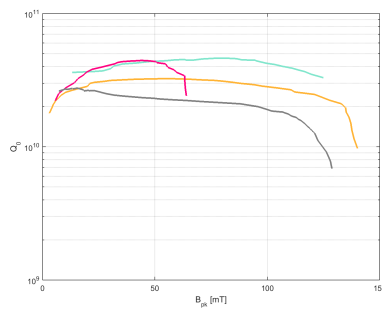
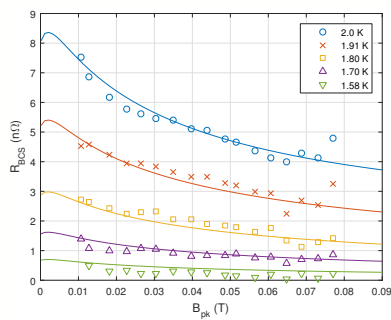


The Anti-Q-Slope and the Mean Free Path



Studies of the Field-Dependent BCS Resistance in Impurity-Doped Nb Cavities

James T. Maniscalco, Thomas Oseroff, Matthias Liepe*



Integrating electron-phonon T_c predictions into material discovery frameworks

Andy Linscheid, Joshua T Paul, P. J. Hirschfeld, Richard Hennig

Oxygen Dissolution and Surface Oxide Reconstructions on Single Crystal Nb(100)

Darren Veit, Jeff Saylor, Natalie Kautz, Richard Hennig, S.J. Sibener

Theory of Nb₃Sn Layer Growth and Defect Formation

Nathan Sitaraman and Daniel Hall

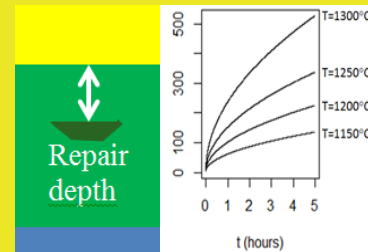
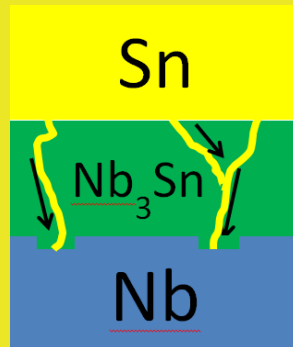
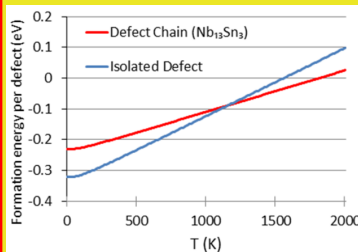
Use DFT to calculate energies



Develop Theory of Layer Growth, Defect Formation



Understand Experimental Implications

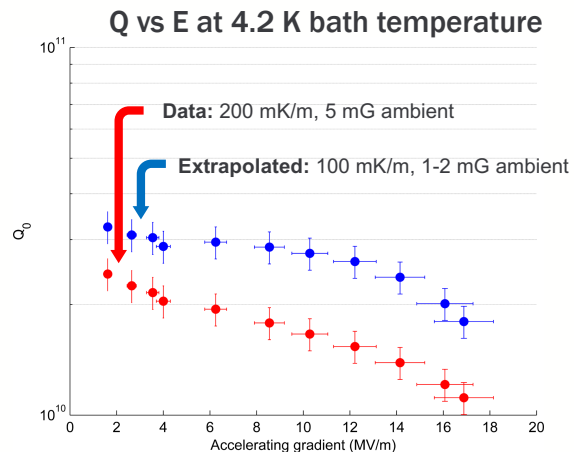
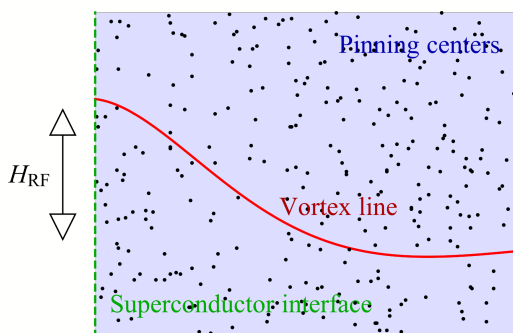


High Efficiency Nb₃Sn SRF Cavities



Contributions to surface resistance from trapped magnetic flux in Nb₃Sn cavities

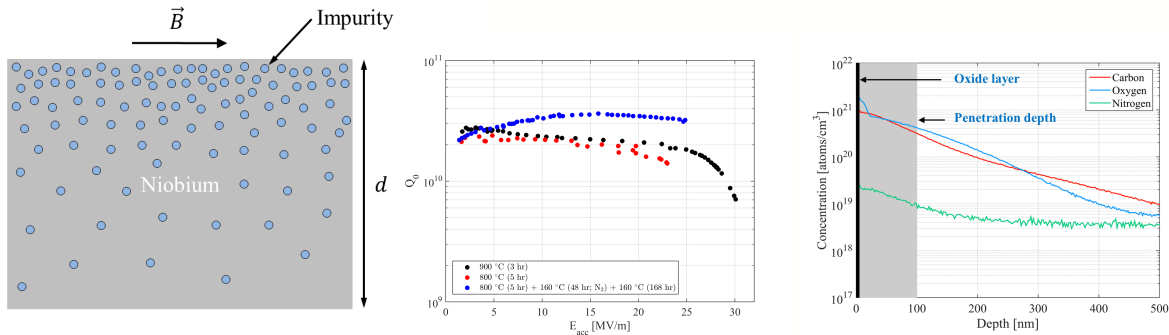
D.L. Hall, D.B. Liarte, M. Liepe, J.P. Sethna





Effects of a Thin Dirty Superconducting Layer on Niobium Cavity Performance

P. N. Koufalist, F. Furuta, M. Liepe, J. T. Maniscalco



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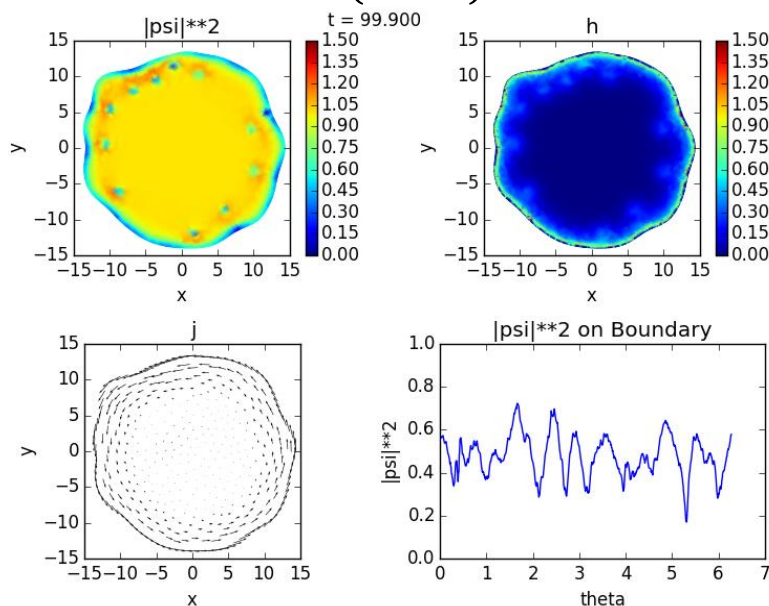
pnk9@cornell.edu

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Computational Simulations of Vortex Nucleation Using Time-Dependent Ginzburg-Landau Theory

Alden Pack and Mark Transtrum

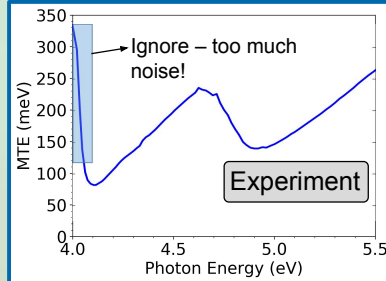
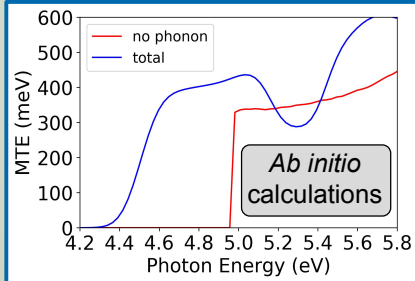
$$Ha = 0.75 (\sqrt{2} H_c), \kappa = 4$$



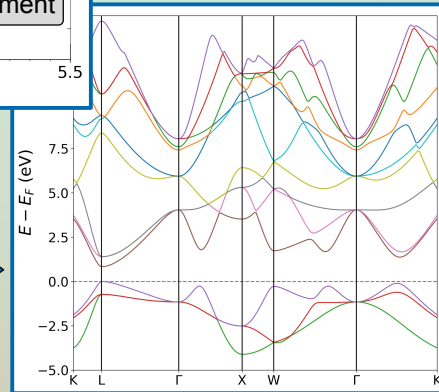
Phonon scattering processes in photoemission from bulk PbTe

J. Kevin Nangoi (Cornell), S. Karkare (LBL), T. A. Arias (Cornell)

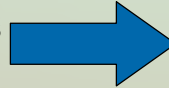
MTE = mean transverse energy



PbTe bulk band structure



Explain MTE features using *band structure*



Photocathode performances improvement via epitaxial growth techniques and innovative materials: A proposal

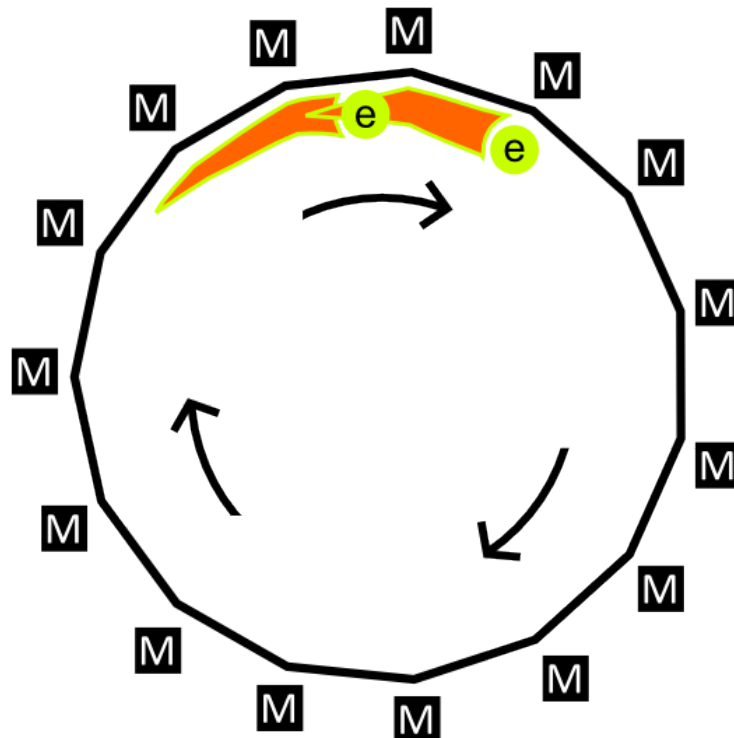
A. Galdj, L. Cultrera, I. Bazarov

Understanding the Limits of Intrinsic Emittance

S. Karkare, Z. Ding, J. Feng, H. Padmore

The Effect of Delay on the Stability of Transverse Motion of Circulating Bunches

A. Bernstein, R. Rand, R. Meller



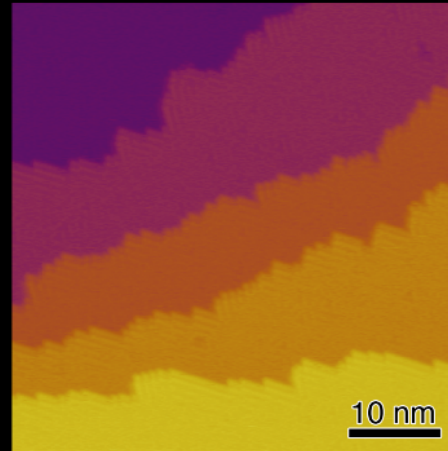
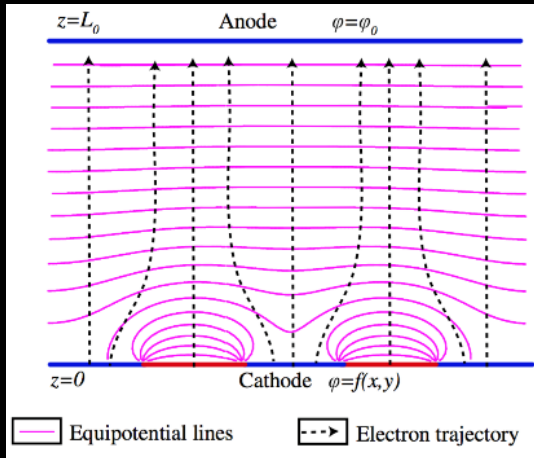
Chemical Control of Photocathode Surfaces: In Search of Brightness

Erik S. Skibinski, William J. I. DeBenedetti, Luca Cultrera, Ivan Bazarov, and Melissa A. Hines
Cornell University

$$\text{Brightness} \propto \frac{E_z}{\text{Mean Transverse Energy (MTE)}}$$

Chemical and physical roughness increase MTE

Scanning tunneling microscope image of atomically flat PbTe(111)



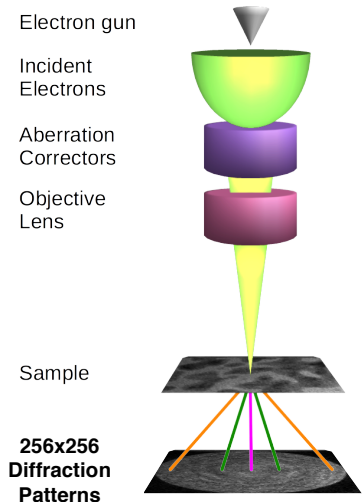
S. Karkare and I. Bazarov *Phys. Rev. App.* 4, 024015 2015

Goal: Understand how to minimize MTE by controlling physical and chemical roughness

Measuring and Correcting TEM Aberrations with a Pixel Array Detector

Paul Cueva, Colin Clement, Benjamin Savitzky, Kayla Nguyen,
James Sethna, and David A. Muller

Measuring and Correcting Transmission Electron Microscopy Aberrations with a Pixel Array Detector



Paul Cueva, Colin Clement, Benjamin Savitzky, Kayla Nguyen, Lena Kourkoutis, James Sethna, David A. Muller

- Obtaining all the scattering information at each point in scan
- Use to characterize sample and diagnose aberrations



Finding stability boundaries and escape rates in kicked Hamiltonians
Archishman Raju, Sayan Choudhury, David Rubin, Amie Wilkinson and James Sethna