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Sasa V. Dordevic

Education

Ph.D.	Physics	(1997 - 2002)	University of California, San Diego
M.S.	Physics	(1995 - 1997)	University of Houston
B.S.	Physics	(1990 - 1995)	University of Nis, Yugoslavia
B.S.	EE	(1989 - 1994)	University of Nis, Yugoslavia

Employment History

Postdoctoral Researcher	(12/02 - present)	Brookhaven National Laboratory
Postdoctoral Researcher	(07/02 – 12/02)	University of California, San Diego
Research Assistant	(09/97 – 06/02)	University of California, San Diego
Teaching Assistant	(09/97 – 03/99)	University of California, San Diego
Research Assistant	(08/95 – 05/97)	University of Houston

Research Interests and Accomplishments

Superconductivity

- Spectroscopic investigation of the characteristic energy scales of the superconducting state in cuprate superconductors.
- Discovery of the universal scaling between the penetration depth and DC conductivity in both high and low temperature superconductors.
- The first systematic infrared study of the Josephson vortex state in high-T_c cuprates.
- Discovery of a new method of extracting the superfluid density from infrared data.
- Discovery of signatures of charge stripes in the c-axis infrared spectra of cuprates.

Heavy Fermion Metals

- Discovery of the universal scaling between the magnitude of the gap and the effective mass in non-magnetic heavy fermions.
- Observation of non-heavy fermion behavior in Heusler alloy Fe_2TiSn.
- The first infrared spectroscopy study of a heavy fermion in high magnetic field.

Novel Thermoelectric Materials

- Investigation of charge and phonon dynamics in filled skutterudites MFe_4P_{12}.(M=La, Th, Ce, U)
- The first optical evidence for localized vibrational mode in filled skutterudites.

Low Dimensional CDW Systems

- Systematic investigation of charge dynamics in 2D CDW metal *2H-*$NbSe_2$.
- Discovery of anisotropic electron-phonon coupling in *2H-*$NbSe_2$

Technical Research Experience

Research experience is focused on the spectroscopy of solids in the tera-hertz, infrared, visible and ultra-violet energy range, both in zero and in high magnetic fields. Specific techniques include reflectance measurements of micro crystals (.5 mm^2), and thin film transmission and reflection experiments. Past instrumentation projects have included:

- Implementing precision reflection and transmission studies in the microwave energy range (down to 4 $cm^{-1} \approx 100$ GHz) and at He-3 temperatures (down to 320 mK).
- Adapting an infrared spectrometer for polarized reflectance and transmission studies of micro crystals.

Invited Talks

Josephson Plasmon and Inhomogeneous Superconducting State in $La_{2-x}Sr_xCuO_4$
BNL Physics Department Seminar — March, 2003

Signatures of Charge Strips in the c-axis reflectance of $La_{2-x}Sr_xCuO_4$
UCLA Physics Department Seminar — September, 2002

High-temperature superconductivity
University of Nis, Serbia and Montenegro, Physics Department Seminar — July, 2002

Heavy Fermion Behavior and Metal-Insulator Transition in Filled Skutterudites
Meeting of the American Physical Society, Indianapolis, IN. — March, 2002

Heavy Fermion Behavior in Filled Skutterudites
UCSD Physics Department Seminar — October, 2000

Contributed Talks

Signatures of charge stripes in the c-axis infrared response of superconducting $La_{2-x}Sr_xCuO_4$
Meeting of the American Physical Society, Austin, TX — March, 2003

Signatures of bi-layer splitting in the c-axis infrared response of multi-layer cuprates
Meeting of the American Physical Society, Austin, TX — March, 2003

An Infrared study of the Josephson vortex state in high-Tc cuprates
Meeting of the American Physical Society, Indianapolis, IN — March, 2002

Anisotropic Electrodynamics of Charge Density Wave Metal 2H-$NbSe_2$
Meeting of the American Physical Society, Seattle, WA — March, 2001

Hybridization Gap in Non-Magnetic Heavy Fermion Materials
Meeting of the American Physical Society, Minneapolis, MN — March, 2000

Interlayer Transport and Superfluid Density in Layered Superconductors
Meeting of the American Physical Society, Minneapolis, MN — March, 2000

Optical Properties of Filled Skutterudites
Meeting of the American Physical Society, Atlanta, GA — March, 1999

Poster Presentations

Interlayer Transport and Superfluid Density in Layered Superconductors
Gordon Research Conference on Superconductivity February, 2000

Publications

S.V. Dordevic, C.C. Homes, J.J. Tu, T. Valla, M. Strongin, P.D. Johnson, G.D. Gu and D.N. Basov, "A new method of extracting electron-boson spectral function $\alpha^2F(\omega)$ from infrared and ARPES spectra using inverse theory", *in preparation.*

S.V. Dordevic, D. N. Basov, N. Takeda, Y. J. Wang, "Magnetic field dependence of hybridization gap and quasiparticle effective mass of heavy fermion $CeRu_4Sb_{12}$, *in preparation*.

S.V. Dordevic, D.N. Basov, Seiki Komiya, Yoichi Ando and Y.J. Wang, "Doping dependence study of the Josephson vortex state in $La_{2-x}Sr_xCuO_4$", *in preparation.*

S.V. Dordevic, Seiki Komiya Yoichi Ando and D.N. Basov, "Josephson Plasmon and Inhomogeneous Superconducting State in $La_{2-x}Sr_xCuO_4$", *accepted for publication in Phys.Rev.Lett.*

C.C. Homes, S.V. Dordevic, D.A. Bonn, R. Liang and W.H. Hardy, "Conductivity sum rules and energy scales in high-temperature superconductors", *accepted for publication in Phys. Rev. B*

C.C. Homes, S.V. Dordevic, D.A. Bonn, R. Liang and W.H. Hardy, "Energy scales in the high-T_c superconductor $YBa_2Cu_3O_{6+x}$", *to appear in J. Superconductivity.*

S.V. Dordevic, E. J. Singley, J. H. Kim, M. B. Maple, T. Room, R. Linag, D. A. Bonn, W. N. Hardy, J. P. Carbotte, T. Timusk, C. C. Homes, M. Strongin and D. N. Basov, "Signatures of bi-layer splitting in the c-axis optical conductivity of double layer cuprates", *submitted to Phys. Rev .B.*

D.N. Basov, S.V. Dordevic, E.J. Singley, W. Padilla, K. Burch, J.E. Elenewski and L.H. Green, "Sub-Terra Hertz Spectroscopy at He-3 temperatures", *submitted to Review of Scientific Instruments.*

S.V. Dordevic, D.N. Basov, R.C. Dynes, B. Ruzicka, V. Vescoli, L. Degiorgi, H. Berger, R. Gaal, L. Forro and E. Bucher, "Optical properties of the quasi-two-dimensional dichalcogenides 2H-$TaSe_2$ and 2H-$NbSe_2$, *The European Physical Journal B, Eur. Phys. J. B* **33**, *15 (2003).*

S. V. Dordevic, D. N. Basov, Seiki Komiya, Yoichi Ando and Y. J. Wang, "An Infrared study of the Josephson vortex state in high-Tc cuprates", *Europhys. Lett.* **61**, 122 (2003).

S. V. Dordevic, D. N. Basov, A. Slebarski, M. B. Maple and L. Degiorgi, "Electronic Structure and Charge Dynamics of Heusler Alloy Fe_2TiSn Probed by Infrared Spectroscopy", *Phys. Rev. B* **66**, 075122 (2002).

S. V. Dordevic, E. J. Singley, D. N. Basov, Seiki Komiya, Yoichi Ando, E. Bucher, C. C. Homes and M. Strongin, "Global trends in the interplane penetration depth of layered superconductors", *Phys. Rev. B* **65**, 134511 (2002).

D. N. Basov, E. J. Singley, S. V. Dordevic "Sum rules and electrodynamics of high-T_c cuprates in the pseudogap state" *Phys. Rev. B* **65**, 054516 (2002).

S. V. Dordevic, D. N. Basov, R. C. Dynes and E. Bucher, "Anisotropic electrodynamics of layered metal 2H-$NbSe_2$", *Phys. Rev. B* **64**, 161103(R) (2001).

S. V. Dordevic, D. N. Basov, N. R. Dilley, E. D. Bauer and M. B. Maple, "Hybridization gap in heavy fermion metals", *Phys. Rev. Lett.* **86** 684 (2001).

N. R. Dilley, E. D. Bauer, M. B. Maple, S. Dordevic, D. N. Basov, F. Freibert, T. W. Darling, A. Migliori, B. C. Chakoumakos and B. C. Sales, "Thermoelectric and optical properties of the filled skutterudite $YbFe_4Sb_{12}$", *Phys. Rev. B* **61**, 4608 (2000).

S. V. Dordevic, N. R. Dilley, E. D. Bauer, D. N. Basov, M. B. Maple and L.Degiorgi, "Optical Properties of MFe_4P_{12} filled Skutterudites" *Phys. Rev. B* **60**, 11321, (1999).