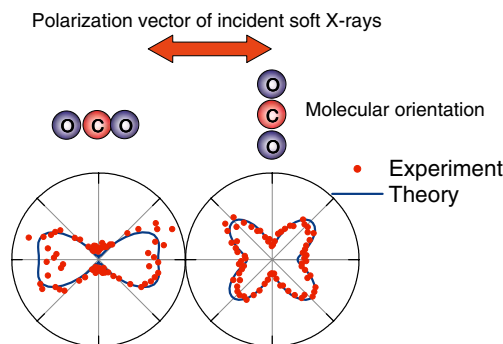


Development of 3-D Momentum Imaging Spectroscopy for a Molecule

We have been developing multiple coincidence momentum imaging spectroscopy, which consists of electron and ion time-of-flight analyzers with multi-hit two-dimensional position sensitive detectors, a supersonic jet, and a fast TDC system. Figure shows an example of C 1s photoelectron angular distributions (PADs) of CO₂ in a molecular frame measured at a photon energy of 320 eV. CO₂ molecules are oriented parallel or perpendicular to the polarization vector of the incident photon beam. The photoelectrons are ejected from the molecule after scattering by the intra-molecular field and thus the PADs reflect the molecular field, geometry, etc.



C 1s photoelectron angular distributions (PADs) of CO₂ in a molecular frame measured at a photon energy of 320 eV

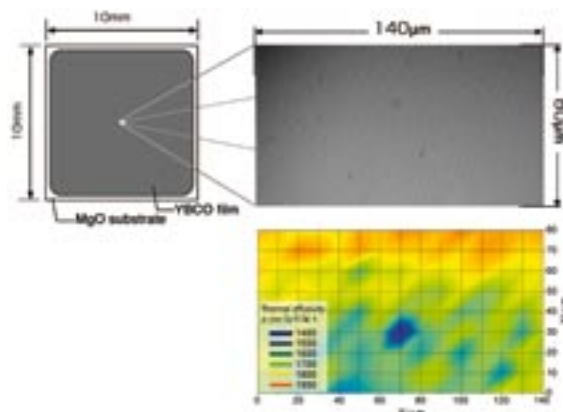
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Thermoreflectance Measurement Technique for the Evaluation of Thermophysical Properties of Oxide Superconducting Thin Films

Fault current limiter (FCL) device is one of the most promising applications of oxide superconducting thin films. In this type of device, the SN transition of superconducting films is utilized for the limitation of the accidental overcurrent. Therefore, the initial consideration in its thermal and mechanical design is inevitably needed for preventing it from breaking due to large thermal stress. We have developed a non-contact thermoreflectance technique to remotely measure thermal effusivity of thin films and applied the technique for the evaluation of YBCO thin films (0.8 μm in thickness) on MgO substrate. The absolute value of thermal effusivity of the YBCO films is clearly confirmed to be comparable with those

of bulk YBCO. This evaluation technique is also expected to be available for detection of defect points of large thin films by scanning probe laser beams.



YBCO thin film specimen (upper left), its optical image (upper right) and the distribution image of its thermal effusivity (lower right) in the center rectangular area of 80×140 μm

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