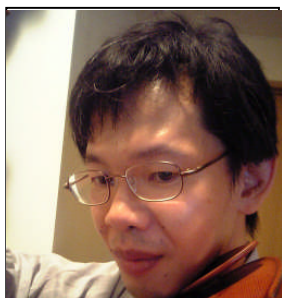


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【Speciality】 laser spectroscopy, molecular physics

【Keywords】 single-protein spectroscopy,
microspectroscopy

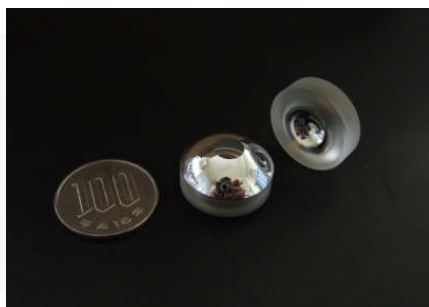
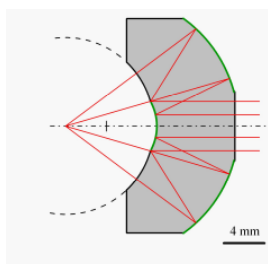
【Research Subject】 **Structure-function relationship of enzymes studied by single-molecule spectroscopy at liquid-helium temperatures**

Research Group Activity

Optical microspectroscopy at low temperature

applied to

single proteins and single nuclear spins



Developing objective lens

for low temperature operation

Single piece construction

enables cooling.

Reflecting optics

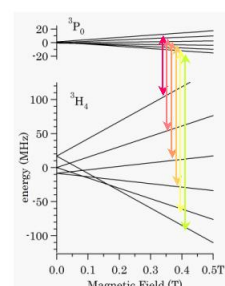
eliminates chromatic aberration.

Detecting quantum state of a single spin in solid

$^3\text{H}_4 - ^3\text{P}_0$ transition (478 nm) of Pr^{3+} doped in LaF_3

Zeeman shifts in $^3\text{H}_4$ and $^3\text{P}_0$ states are different.

Different spin states absorb at different wavelengths.



Currently, we are preparing optical detection of single Pr^{3+} ion by building wavelength-stabilized ($< 10^{-8}$ /day) light source