NUMERICAL CALCULATIONS OF THE STOKES VECTOR TRANSFER EQUATION

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We have made intensive numerical calculations on the Stokes vector transfer of Fe I 6302.5Å line polarized by magnetic field embedded in solar active region, in order to make a calibration of Stokes data observed by VMG of SOFT(Solar Flare Telescope) at BOAO.

In our calculation, three kinds of photospheric models (VAL-C, Penumbra and Umbra) have been used to examine detail profiles of polarized line formed in quiet region and sunspot acive region, respectively.

To improve our computing time, we chose multi-step integration method rather than Runge-Kutta method and took boundary conditions obtained by Landi del'Innocenti(1976).

In addition, to check whether our code works well or not, we have carried out same calculations for other spectral lines of FeI, including CaII and NaI of which atomic line parameters are well-known.

As a result, we will present the calibration curves for each model and we will discuss the validity of our calculation and model dependency of the calibration curves.

EFFECTS OF DUST IN QUASI-SPHERICAL ACCRETION MODEL OF Sgr A*

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A peculiar radio source in the Galactic Center, Sgr A*, can be successfully modelled by the spherical or quasi-spherical accretion onto supermassive black holes. The emission spectrum ranging from radio to gamma-ray is explained by thermal synchrotron and bremsstrahlung radiation from the infalling gas. However, it is possible that the presence of dust in the gas would change the emission spectrum especially in IR band. So we calculate the temperature of the different size dust grains, heated by collsion with gas particles and by outcoming radiation and cooled by thermal blackbody emission. For freely falling spherical accretion, dust grains are heated up to 240K ~ 300K depending on the size of the grain.

This is not far from the equilibrium dust temperature expected in the vicinity of Sgr A*. The total IR emission from these dust is about 1000 times smaller than the recently detected IR emission. Hence, the presence of the dust would not affect the validity of the spherical or quasi-spherical accretion model.