

MACHO DETECTION FROM MEASUREMENTS OF GRAVITATIONAL DEFLECTION

KOUJI OHNISHI

*Nagano National College of Technology
Nagano 381-8550, Japan*

MIZUHIKO HOSOKAWA

*Communications Research Laboratory
4-2-1 Nukui-kita, Koganei, Tokyo 184, Japan*

AND

TOSHIO FUKUSHIMA

*National Astronomical Observatory
2-21-1, Ohsawa, Mitaka, Tokyo 181, Japan*

The observed positions of quasars are fluctuated due to the gravitational lensing of the matters in our galaxy. The magnitude of fluctuation due to stars and MACHOs is of the order of a few micro-arc second (μas) $\sim 10 \mu\text{as}$ and its time scale is of the order of a few years \sim hundreds years (Hosokawa *et al.* 1997). Such fluctuation will reflect the nature of the constituents, both visible and invisible, of our galaxy.

We calculate the probabilities (optical depths) of such fluctuation (i.e. positional shift and apparent proper motion of the quasars) as the functions of the parameters of the galaxy model that consist of stars and MACHOs. The observation of hundreds of quasar's position with a few μas accuracy for several years will enable us to estimate the density profile of galactic MACHO halo (i.e. core radius and axis ratio of spheroidal equipotential). The possibility to obtain such accuracy is now began to consider seriously in some VLBI and optical interferometer plans (Sasao *et al.* 1994).

References

- Hosokawa, M., Ohnishi, K., & Fukushima, 1997, *AJ*, 114, 1508
Sasao, T., et.al., 1994, *VLBI Technology*, ed. T. Sasao, S. Manabe, O. Kameya & M. Inoue, (Terra Scientific Publ. Co.), 254