

Black hole mass and the reverberation size-luminosity relation based on the 6-year Seoul National University Monitoring Project (SAMP)

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Black hole mass is a key parameter for understanding black hole growth and AGN physics. The method of determining black hole has been rapidly evolved over the last 20 years. We will present the latest results of reverberation mapping (RM) studies based on the 6 year SNU monitoring project, using a sample of 32 AGNs with relatively high luminosity ($L_{5100} > 10^{44}$ erg/s). With hundreds of nights of regularly sampled spectroscopic/photometric observations, we successfully obtain reliable H beta lags and BH masses for 24 objects, finding that the BLR sizes of these objects are smaller than the expectation from the previous size-luminosity relation. By applying a uniform lag analysis to available H beta RM light curves from the literature, we remeasured the H beta lag of the most reliable ~100 AGNs, redefining the size-luminosity relation with a slope of 0.41 ± 0.22 and an intrinsic scatter of 0.192 dex. For ~20 AGNs, we will present the velocity resolved lag measurements and discuss the implication of these results on the BLR properties. We will also present the H alpha size-luminosity relation and discuss new constraints on finding intermediate-mass black holes. Finally we will review the uncertainty of black hole masses based on the size-luminosity relation and single-epoch method.

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