Flux monitoring observations of Sgr A* at 8 GHz and 2 GHz with the NICT Kashima-Koganei VLBI system

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We have conducted flux monitoring observations of Sgr A* at 8 GHz and 2 GHz using the NICT Kashima-Koganei VLBI system (109 km baseline) since mid-February 2013. The primary objective of the monitoring is a search for flux variation which is expected to be caused by the interaction between the G2 cloud and the accretion disk. Until September 22 2013, we observed Sgr A* for 39 days, five hours on each day. Four quasars (NRAO530, PKS 1622-253, PKS 1622-297, PKS 1921-293) were also observed as flux calibrators every 6 minutes. No significant change nor variation has been detected in the 8 GHz flux density of Sgr A* yet. The 8 GHz flux density was 0.81±0.07 Jy (preliminary), while no significant 2 GHz emission was detected by our system. We will continue these monitoring as often as possible until at least May 2014. In this poster, we present the result of our flux monitoring.

The gas cloud G2 is approaching Sgr A*!

Last year, the Max-Plank-Institut für extraterrestrische Physik (MPE) group has reported the discovery of a gas cloud G2 falling toward Sgr A* (Gillessen et al. 2012). Tidal disruption of the G2 cloud will increase mass accretion rate onto the central SMBH, causing a flare in multi-wavelength. The interaction between hot plasma around Sgr A* and the G2 cloud may cause a bow shock, accelerating electrons, which emit synchrotron radiation in radio wavelength (Narayan et al. 2012).

Our flux monitoring system

The NICT Kashima-Koganei VLBI system

• Observing frequencies: 2.21-2.29 GHz, 8.2-8.5 GHz
• KS/VSSP32 samplers
• Baseline length: 109.1 km
• Angular resolutions: 280 mas (2 GHz), 70 mas (8 GHz)
• Current total observing days: 39 days
  (from 15 February 2013 until 22 September 2013)
• Observing time: 5 hours per day (EISgr A*±15°)
• Calibrators: NRAO530, PKS 1622-253,
  PKS 1622-297, PKS 1921-293
  (until DOY78, NRAO 530 only)
• Integration times: Sgr A*•••300 s
  NRAO 530, PKS 1921-293•••30 s
  PKS 1622-253, PKS 1622-297•••240 s

Sgr A* was not detected in 2 GHz with our system. No significant flux variation has been detected in 8 GHz yet!

The 8 GHz flux density of Sgr A* was very stable 0.81±0.07 Jy (preliminary). We will continue these monitoring until at least May 2014.

Stay tuned!