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Cosmological mass transport on galactic nuclei and the formation of high redshift quasars.

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By using AMR cosmological hydrodynamic N-body zoom-in simulations, with the RAMSES code, we studied the mass transport processes onto galactic nuclei from high redshift up to z~6. Due to the large dynamical range of the simulations we were able to study the mass accretion process on scales from ~50 kpc to ~pc. The SMBHs are modelled as a sink particles at the center of our galaxies, which allowed us to quantify the BH growth in relation with the mass transport processes associated to three different
angular momentum fluxes: i) Reynolds stress, ii) gravitational stress and iii) viscous stress. Such a quantification allowed us to identify the main mass transport process as a function of the scales of the problem. We found that in simulations that include radiative cooling and SNe feedback, the SMBH grows at the Eddington limit most of the time. The disk momentum flux is dominated by the Reynolds
stress transporting mass at a rate of ~1-10 Msun/yr. This level of SMBHs accretion rates found in our cosmological simulation, are needed in all models of SMBH growth attempted to explain the formation of redshift 6-7 quasars.

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