Effects of interorbital hopping on orbital fluctuations and metal-insulator transitions. YUN SONG, Department of Physics, Trent University, LIANG-JIAN ZOU, Insititute of Solide State Physics, Chinese Academy of Sciences — We study the effects of inter-orbital hopping on orbital fluctuations and Mott-Hubbard metal-insulator transition (MIT) in the two-orbital Hubbard model within the extended linearized dynamical mean-field theory. By mapping the model onto an effective model with different bandwidths through the canonical transformation, we find that at half filling, the increases of the inter-orbital Coulomb interaction $U'$ and the Hund’s coupling $J$ drive the MIT, and the critical $J_c$ for MIT increases with the lift of the inter-orbital hopping integral $t_{ab}$. Meanwhile at quarter filling and in the strong correlation regime, the system without $t_{ab}$ exhibits MIT with the decreasing of $J$, and favors the orbital liquid ground state. However, the system transits from metal to insulator with the increasing of $t_{ab}$, accompanied with the rising of the orbital order parameter. These results show the important role of the inter-orbital hopping in the orbital fluctuation and orbital ordering.