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d-d electronic excitations in manganites by resonant inelastic x-ray scattering.

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We report a study of the electronic excitations in a range of magnetic and electronic ground states in manganites utilizing Mn K-edge resonant inelastic x-ray scattering. The spectra were measured between 1.5 and 16 eV of energy loss, at finite q. Excitations with energy as high as 10 eV exhibits a temperature dependence which is systematicaly related to the magnetism. On the basis of LDA+U, we calculated the electronic structure, the Wannier functions of the highest occupied and lowest unoccupied states, and finite-q response functions. The finite-q dynamical structure factor reproduce the main features and the magnetic dependence of the spectra. We identify the temperature dependent excitations as the intersite electron transfers between spin-polarized states. These excitations are enhanced (reduced) for ferro-magnetic (anti-) Mn neighbors.