

[P-126/GC-14] The Mid-infrared View of Red Sequence Galaxies in Abell 2218 with AKARI

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We present the AKARI InfraRed Camera (IRC) imaging observation of early-type galaxies in A2218 at  $z \sim 0.175$ . Mid-infrared (MIR) emission from early-type galaxies traces circumstellar dust emission from AGB stars or/and residual star formation. Including the unique imaging capability at 11 and 15 micron, our AKARI data provide an effective way to investigate MIR properties of early-type galaxies in the cluster environment. Among our flux-limited sample of 22 red sequence early-type galaxies with precise dynamical and line strength measurements ( $< 18$  mag at 3 micron), we find that at least 41% have MIR-excess emission. The N3-S11 versus N3 (3 and 11 micron) color-magnitude relation shows the expected blue sequence, but the MIR-excess galaxies add a red wing to the relation especially at the fainter end. A SED analysis reveals that the dust emission from AGB stars is the most likely cause for the MIR-excess, with low level of star formation being the next possible explanation. The MIR-excess galaxies show a wide spread of N3-S11 colors, implying a significant spread (2 -11 Gyr) in the estimated mean ages of stellar populations. We study the environmental dependence of MIR-excess early-type galaxies over an area out to a half virial radius ( $\sim 1$  Mpc). We find that the MIR-excess early-type galaxies are preferentially located in the outer region. From these evidences, we suggest that the fainter, MIR-excess early-type galaxies have just joined the red sequence, possibly due to the infall and subsequent morphological/spectral transformation induced by the cluster environment.

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