Searching for the Culprit of Anomalous Microwave Emission: An AKARI PAH-range Analysis of Probable Electric Dipole Emitting Regions

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In the relentless march forward of interstellar medium inquiry, many new species of interstellar dust have been modeled and discovered. The modes by which these species interact and evolve are beginning to be understood, but in recent years a peculiar new feature has appeared in microwave surveys. Anomalous microwave emission (AME), showing up between 10 and 90Ghz, has been correlated with thermal dust emission, leading to the popular suggestion that this anomaly is electric dipole emission from spinning dust (Draine & Lazarian 1998). Small grains, possibly PAHs, are a leading suspect. We present data from AKARI/Infrared Camera (IRC, Onaka et al. 2007) - due to the effective PAH band coverage of its 9um survey- to investigate their role within a few regions showing strong AME in the Planck low-frequency data. We include the well-studied Perseus and rho Ophiuchi clouds, as well as a few targets newly identified by the Planck Collaboration (Dickinson et al. 2013). We use the IRAS/IRIS 100um data and the AKARI/FIS FIR data to account for the overall dust temperature in our target regions, and present our results as a ratio of 9um emission to the total far infrared intensity which indicates the PAH abundance.