Airborne Far Infrared Observations of the Galactic Center Region.


Maps of a region 10' in diameter around the galactic center made from the NASA Kuiper Airborne Observatory simultaneously in three wavelength bands at 30 μ, 50 μ, and 100 μ with ~1' resolution are presented, and the distribution of far infrared luminosity and color temperature across this region is derived. The position of highest far infrared surface brightness coincides with the peak of the late-type stellar distribution and with the H II region Sgr A West. The high spatial and temperature resolution of the data is used to identify features of the far infrared maps with known sources of near infrared, radio continuum, and molecular emission. The emission mechanism and energy sources for the far infrared radiation are analyzed qualitatively, and it is concluded that all of the observed far infrared radiation from the galactic center region can be attributed to thermal emission from dust heated both by the late-type stars and by the ultraviolet sources which ionize the H II regions. A self-consistent model for the far infrared emission from the galactic center region is presented. It is found that the visual extinction across the central 10 pc of the Galaxy is only about 3 magnitudes, and that the dust density is fairly uniform in this region. The absorption efficiency of the grains is found to vary as λ^{-1} out to 100 μ. An upper limit of 10^7 L_☉ is set on the luminosity of any presently unidentified source of 0.1 to 1 μ radiation at the galactic center.