



Transformations between WISE, 2MASS, SDSS and BVRI photometric systems: I. Transformation equations for dwarfs

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We present colour transformations for the conversion of the W1 and W2 magnitudes of WISE photometric system to the Johnson-Cousins' BVRI, SDSS (gri), and 2MASS (JHK_s) photometric systems, for dwarfs. The W3 and W4 magnitudes were not considered due to their insufficient signal to noise ratio (S/N). The coordinates of 825 dwarfs along with their BVRI, gri, and JHK_s data, taken from Bilir et al. (2008) were matched with the coordinates of stars in the preliminary data release of WISE (Wright et al., 2010) and a homogeneous dwarf sample with high S/N ratio have been obtained using the following constraints: 1) the data were dereddened, 2) giants were identified and excluded from the sample, 3) sample stars were selected according to data quality, 4) transformations were derived for sub samples of different metallicity range, and 5) transformations are two colour dependent. These colour transformations, coupled with known absolute magnitudes at shorter wavelengths, can be used in space density evaluation for the Galactic (thin and thick) discs, at distances larger than the ones evaluated with JHK_s photometry.

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