

Massive open star clusters using the VVV survey I. Presentation of the data and description of the approach

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Context: The ESO Public Survey "VISTA Variables in the V_A-a L_Actea" (VVV) provides deep multi-epoch infrared observations for an unprecedented 562 sq. degrees of the Galactic bulge, and adjacent regions of the disk. **Aims:** The VVV observations will foster the construction of a sample of Galactic star clusters with reliable and homogeneously derived physical parameters (e.g., age, distance, and mass, etc.). In this first paper in a series, the methodology employed to establish cluster parameters for the envisioned database are elaborated upon by analyzing a subsample of 4 known young open clusters: Danks 1, Danks 2, RCW 79, and DBS 132. The analysis offers a first glimpse of the information that can be gleaned for the final cluster database from the VVV observations. **Methods:** Wide-field, deep JHKs VVV observations, combined with new infrared spectroscopy, are employed to constrain fundamental parameters for a subset of clusters. **Results:** Results inferred from the deep near-infrared photometry which features mitigated uncertainties (e.g. the accuracy of the photometry is better than 0.1mag for K_s<18mag), the wide field-of-view of the VVV survey, and numerous high quality low resolution spectra (typically more than 10 per cluster), are used to establish independent cluster parameters which enable existing determinations to be assessed. An anomalous reddening law in the direction toward the Danks' clusters is found, i.e. $E(J-H)/E(H-K_s)=2.20\pm 0.06$, which exceeds published values for the inner Galaxy. The G305 star forming complex, which includes the Danks' clusters, lies beyond the Sagittarius-Carina spiral arm and occupies the Centaurus arm. Finally, the first deep infrared color-magnitude diagram of RCW 79 is presented which reveal a sizable pre-main sequence population. A list of candidate variable stars in G305 region is reported.

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