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Hipparcos Variable Star Detection and Classification Efficiency

P. Dubath, I. Lecoeur-Taïbi, L. Rimoldini, M. Süveges, J. Blomme, M. López, L. M. Sarro, J. De Ridder, J. Cuypers, L. Guy, K. Nienartowicz, A. Jan, M. Beck, N. Mowlavi, P. De Cat, T. Lebzelter, L. Eyer

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A complete periodic star extraction and classification scheme is set up and tested with the Hipparcos catalogue. The efficiency of each step is derived by comparing the results with prior knowledge coming from the catalogue or from the literature. A combination of two variability criteria is applied in the first step to select 17 006 variability candidates from a complete sample of 115 152 stars. Our candidate sample turns out to include 10 406 known variables (i.e., 90% of the total of 11 597) and 6600 contaminating constant stars. A random forest classification is used in the second step to extract 1881 (82%) of the known periodic objects while removing entirely constant stars from the sample and limiting the contamination of non-periodic variables to 152 stars (7.5%). The confusion introduced by these 152 non-periodic variables is evaluated in the third step using the results of the Hipparcos periodic star classification presented in a previous study (Dubath et al. [1]).

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