A SIMPLE CLASSIFICATION SCHEME FOR NEAs. B S Shylaja[1], J Bhavani Prasad[2], P Santosh[3] ,C R Prasanna Kumar[2], 1. Jawaharal Nehru Planetarium, Bangalore Association for Science Education, High Grounds, Bangalore, 560 001, India taralaya@vsnl.com 2. Vijaya College, R V Road, Basavanagudi, Bangalore 560 004, India, 3. BHS Junior College, IV Block, Jayanagar, Bangalore 560 011, India

Introduction: Asteroids have been classified into C, S and M types based on the spectral characterestics. Upon availability of better resolution spectra the differences in the same groups have become more apparent leading to sub classification. Meteorite spectra provided yet another scheme for classification.

The list of asteroids is growing fast as we are able to reach fainter and fainter members. It has therefore become inevitable that we find a quick method of determining the sub classification. This is especially true with the NEAs, which are available for a very short duration. They are usually beyond the limit of medium sized telescopes for spectroscopic analysis. However, they are within the reach, when they are at distances of multiples of lunar distance. This duration, which may hardly extend to about an hour, needs to be utilised efficiently to get the subtype by medium sized ground based telescopes. Here we propose a four- colour photometry akin to the 13 colour photometry.

Procedure: The spectra of NEAs are generally featureless, with only the broad 0.9micron pyroxene prominently recognisable. The olivine absorption band at 0.7micron also is identifiable in many cases. We chose the wavelengths to avoid these features. The ratio of reflectances at 545nm to 560nm is compared with corresponding ratio at 620nm and 660nm. These wavelengths are within the visible domain so that one does not have to depend on the IR measurements. The technique is similar to using the slope in the 400 –500 nm region and compare it with the slope in the 600 – 700 nm region.

The method has been verified from the reflectance spectra of NEAs as obtained from Zellner et al. 1985 and MIT-UH-IRTF Joint Campaign. The results are presented in Figure 1. The efficiency of the method is immediately apparent.

Thus four broad band filters have to be utilised at the specified wavelengths and the NEAs have to be monitored during their nearest encounter.

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Figure 1. The correlation of the ratio of reflectance 540 to 560 nm and the ratio 620 to 660 nm cane used to segregate the subgroups of asteroids.