Meteoroid Dynamics Through Clustering R. H. Soja[1] and W. J. Baggaley[2], [1]University of Canterbury (rhs38@student.canterbury.ac.nz), [2]University of Canterbury (jack.baggaley@canterbury.ac.nz).

There are a number of motivations for studying the clustering structure in meteor orbit data. These range from investigation of cometary and asteroidal stream structure (which manifests as meteor showers), to the potential for clustering due to (largely Jovian) resonant or Solar radiation effects. Other methods are, in many cases, available for studying such dynamics: the question here is whether methods of investigating clustering can be successfully used on current meteor data, and thus may provide an alternative method of studying these dynamical processes.

Dynamical information from meteor radar systems is particularily suited to such studies due to the large datasets that are produced (compared with, for example, photographic datasets). A number of radar datasets are available at present – including from the Advanced Meteor Orbit Radar (AMOR) in New Zealand, the Canadian Meteor Orbit Radar (CMOR) in Ontario, and data from various meteor orbit radar archived by the IAU Meteor Data Center (including from the Harvard, Adelaide and Obninsk radars). Between them, these datasets cover a wide range of observing locations (northern and southern hemispheres) and limiting magnitudes (and thus particle size), and also vary significantly in the number of orbits available.

In a previous study,[1] various clustering methods were investigated using AMOR data, particularly with respect to identification of cometary meteor showers, with varying success. Here some of these techniques are extended to different datasets.

References:

[1] Galligan D.P. & Baggaley, W.J. (2003) *Mon. Not. Roy. Astro. Soc., 340,* 899-907.