

## **TraCD: Tracking Cluster Debris**

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### **Abstract**

The accuracy to which open cluster recovery within a multi-D chemical parameter space has been investigated, in line with the motivations of TraCD and Galactic Archaeology. Having determined that spatial and kinematic structure of a background sea of old stars upon which populations of dissolved clusters are superimposed were consistent, the act of cluster recovery has been pursued. Utilising a minimum spanning tree algorithm, the presented analyses have attempted to determine to what extent the recovery of dissolved clusters may be successfully constrained in the presence of an observationally motivated chemical distribution. Having defined parametric and non-parametric exit conditions to which the hierarchical group finding algorithm would exit, it is found that cluster recovery is very sensitive to the observationally motivated chemistry. Having also investigated a disk decomposed cluster recovery scheme, it was found that the presence of an observationally motivated chemical scatter acts to severely denature the success of cluster recovery. As such, we may conclude that the scheme of cluster recovery within the scope of multi-D group finding algorithms requires an increasingly sophisticated approach, in line with the complex chemical distributions as observed in the disk of the Milky Way.