1125-05-1080 **Steve Kirkland*** (stephen.kirkland@umanitoba.ca). *On the Characteristic Set, Centroid, and Centre for a Tree.* Preliminary report.

Let T be a tree on vertices $1, \ldots, n$, and let L be the corresponding Laplacian matrix. The algebraic connectivity of T is the smallest positive eigenvalue of L; a corresponding eigenvector is known as a Fiedler vector. Given a Fielder vector v, either a) there is a unique vertex i such that $v_i = 0$ and i is adjacent to a vertex j with v_j nonzero, or b) there is a unique pair of adjacent vertices k, l such that $v_k v_l < 0$. The characteristic set for T is $\{i\}$ in case a), and is $\{k, l\}$ in case b). The characteristic set can be viewed as a 'middle' of the tree.

A tree has both a unique centroid and a unique centre, and each can also be viewed as a 'middle' of the tree. In view of that observation, it is natural to wonder how far the characteristic set for a tree can be from its centroid and centre, respectively. In this talk we identify families of trees that maximise the distance from the characteristic set to the centroid and centre, respectively. We also determine the asymptotics for the maximum distance (taken over all trees on n vertices) between the characteristic set and the centroid, and between the characteristic set and the centre. (Received September 14, 2016)