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Eva Czabarka* (czabarka@math.sc.edu). *Phylogenetic trees and cyclic permutations*. Preliminary report.

A phylogenetic tree is a leaf-labeled tree with internal vertices having degree at least three (binary if the degrees are three). A drawing of a phylogenetic tree induces a cyclic permutation (by, say, a clockwise ordering of the leaves around the drawing). I am aware of two papers in the literature (by Steel and Semple, *Advances in Applied Mathematics* 2004 by Steel and Szekely, *Appl Math Lett.* 2009) that connects phylogenetic trees with cyclic permutations. A cyclic permutation of a tree excludes some quartet splits. A quartet split is a binary tree induces by 4 leaves. Any cyclic ordering of 4 labels exclude one of the three possible quartet splits on these leaves. There are several data sets that allow for several trees consistent with a given information, and there is need for these trees to be encoded in a concise way. We have made the first steps towards using cyclic permutations to encode trees and sets of trees; e.g. we can show that a binary tree can be determined from two permutations corresponding to two of its drawings. (Received January 17, 2012)