1073-05-204 **Allen Knutson*** (`allenk@math.cornell.edu`). *Positroids, shifting, and a combinatorial Vakil's "geometric Littlewood-Richardson rule".*

Erdős-Ko-Rado defined a "shifting" operation $i \to j$ on collections from $\binom{[n]}{k}$; loosely speaking, one turns is into js unless something's in the way. The "shifted" (or "Schubert") matroids that are invariant under all shifts with $i < j$ are the ones whose coloop-free flats are initial intervals $[1, j]$. An *interval positroid* is a matroid on $[1, n]$ all of whose coloop-free flats are intervals $[i, j]$, a particularly nice class that includes lattice path matroids.

A shift M' of a matroid M on $[1, n]$ is usually not a matroid (though the "sweep" $M \cup M'$ is). I'll explain why it's algebro-geometrically interesting to look for the maximal submatroids of a non-matroid such as M'.

Then I'll define (partially filled) "puzzles", and associate an interval positroid to each one. Filling in a puzzle piece corresponds to shifting the matroid, then decomposing the collection into maximal submatroids. This is a combinatorial way of following Vakil's "geometric Littlewood-Richardson rule". (Received August 01, 2011)