1139-52-24   **Barry Monson*** (`bmonson@unb.ca`) and **Egon Schulte**. *Symmetries of Universal Alternating Semiregular Polytopes.* Preliminary report.

Any abstract regular n-polytope R has a free extension U_R, a regular $(n+1)$-polytope whose n-faces are all isomorphic to R [Schulte, 1983]. Think of such R's as building blocks which we glue together face-to-face in the 'freest possible way'. The automorphism group of U_R is about as complicated as that of its building block R.

Recently we extended this construction by allowing two kinds of compatible building blocks P and Q. Since the facets of these regular n-polytopes are all isomorphic, we can fit copies of P and Q in alternating fashion around $(n-2)$-faces. Again doing this in the freest possible way we get the universal alternating semiregular $(n+1)$-polytope $U_{P,Q}$. We know a lot about its structure: for example, $U_{P,Q}$ covers any $(n+1)$-polytope (of arbitrary symmetry) whose facets alternate between any selection of quotients of P and Q. But when $P \not\cong Q$ and we want to understand the regular covers of $U_{P,Q}$ itself, we run into confounding and unexpected difficulties. I will complain about this as time permits. (Received December 30, 2017)