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Petrie–Coxeter maps revisited

A technique is presented for constructing new chiral or regular polyhedra (or maps) from self-dual abstract polytopes of rank 4. From improperly self-dual chiral polytopes we derive “Petrie–Coxeter-type” polyhedra (abstract chiral analogues of the classical Petrie–Coxeter polyhedra) and investigate their groups of automorphisms.