Mathematical Physics

Branching of the W(H4) Polytopes and Their Dual Polytopes under the Coxeter Groups W(A4) and W (H3) Represented by Quaternions

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4-dimensional H4 polytopes and their dual polytopes have been constructed as the orbits of the Coxeter-Weyl group W(H4) where the group elements and the vertices of the polytopes are represented by quaternions. Projection of an arbitrary W(H4) orbit into three dimensions is made preserving the icosahedral subgroup W(H3) and the tetrahedral subgroup W(A3), the latter follows a branching under the Coxeter group W(A4) . The dual polytopes of the semi-regular and quasi-regular H4 polytopes have been constructed.

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