



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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