Dodecahedral Structures from D_6 lattice

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3D-facets of the Delone cells of the root lattice which tile the six-dimensional Euclidean space in an alternating order are projected into three-dimensional space. They are classified into six Mosseri-Sadoc tetrahedral tiles of edge lengths 1 and golden ratio with faces normal to the 5-fold and 3-fold axes. The icosahedron, dodecahedron and icosidodecahedron whose vertices are obtained from the fundamental weights of the icosahedral group are dissected in terms of six tetrahedra. A set of four tiles are composed out of six *fundamental* tiles, faces of which, are normal to the 5-fold axes of the icosahedral group. It is shown that the 3D-Euclidean space can be tiled face-to-face with maximal face coverage by the composite tiles with an inflation factor generated by an inflation matrix. We note that dodecahedra with edge lengths of 1 and naturally occur already in the second and third order of the inflations. The 3D patches displaying 5-fold, 3-fold and 2-fold symmetries are obtained in the inflated dodecahedral structures with edge lengths with n^{th} power of the golden ratio. The planar tiling of the faces of the composite tiles follow the edge-to-edge matching of the Robinson triangles.

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