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Total colouring of (sub)cubic Halin graphs

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A Halin graph is a planar graph consisting of a tree and an additional cycle connecting all the leaves in such manner that no two edges are crossing.

Total colouring of a graph is a mapping from the set of vertices and edges to a set of colours such that no two neighbouring objects receive the same colour.

As there were only 4 known cubic Halin graphs with total chromatic index greater than 4, a natural question of whether the number of such graphs is finite had arisen.

We managed to prove that the set of cubic Halin graphs with total chromatic index greater than 4 is finite, containing only the cubic Halin graphs known before-hand. By a slight modification of our approach, we managed to establish similar results for total and also AVD-colouring of subcubic Halin graphs.

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