Toroidal azulenoids

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An azulenoid is a carbon network in which there exists a partition of the atoms into azulenes (a five ring and a seven ring that share an edge) and that has the potential for interesting chemical applications. We will discuss the question what the possible forms of toroidal azulenoids — i.e. azulenoids that form a torus — with one orbit of azulenes are.
This problem is equivalent to finding periodic azulenoid tilings of the plane. To enumerate and classify certain types of tilings we need a symbolic description for these tilings. Delaney-Dress symbols turned out to be a very efficient means for the purpose of enumerating periodic tilings.
We will give a short introduction to these Delaney-Dress symbols and describe the methods we used to generate this specific class of tilings.
Furthermore we give examples of the 1274 azulenoid tilings that were generated.