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Reversing a polyhedral surface

We introduce a new variety of flexatube, a *rhomboflexatube*. It is obtained from a cardboard rhombohedron by removing a pair of opposite faces (rhombi), and then subdividing the remaining four faces by pairs of diagonals. It is reversible, that is, it can be turned inside out by a series of folds, using edges and diagonals of the rhombi. To turn a rhomboflexatube inside out is quite a challenging puzzle. We also consider the reversibility of general polyhedral surfaces. We show that if an orientable polyhedral surface with boundary is reversible, then its genus is 0 and for every interior vertex, the sum of face angles at the vertex is at least 2π . After defining tube-attachment operation, we show that every polyhedral surface obtained from a rectangular tube by applying tube-attachment operations one after another can be subdivided so that it becomes reversible.