SYMPAB - (16147) - VISUALIZATION OF CURVED SPACES IN GENERAL RELATIVITY

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Short Abstract

In this contribution we discuss the visualization of three-dimensional (3D) spaces with non-Euclidean geometry. The focus is on the cosmological spaces with the three possible cases of constant positive, negative, or null curvature. In many textbooks these spaces are visualized by means of a two-dimensional (2D) analogy. The sphere, the saddle, and the plane are used to visually represent geometries with constant positive, negative, and null curvature, respectively. We discuss the potential and the pitfalls of this analogy and then present a new, 3D visualization. This is based on sector models, a type of models that can represent curved spaces and spacetimes in two and three dimensions. We show that the sector model visualization avoids the pitfalls of the 2D analogy.