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Symmetry Groups of Chokwe Sona Drawings. Preliminary report.

The Sona drawings of the Chokwe people of Angola/Zaire are a particularly attractive form of “mirror curves,” visualizable as a ball bouncing through an arrangement of dots, bouncing off “mirrors” placed between some of the dots, and leaving a closed trail behind. Unlike some other drawing traditions, these mirrors are always placed on the perpendicular bisector to a line connecting two closest points. The Chokwe artistic aesthetic strongly prefers mirror curves that: separate each dot in a grid from the others, generate an Eulerian circuit, and are highly symmetric. To investigate some of the possibilities for such Chokwe Sona, we classify the rectangular arrays of dots which can generate cyclic or dihedral central symmetry groups, show that all but the smallest rectangles allow for the construction of Sona with any of the seven linear symmetry groups, and begin an investigation into the realizable 2-dimensional symmetry groups for such Sona. For central symmetry groups, the symmetries can be exact, while for the linear and wallpaper symmetry groups, boundary modifications are required to close the Eulerian curves, while maintaining the symmetry group on the primary part of the Sona. (Received September 16, 2008)