The compensation of Gaussian curvature in developable cones is local JIN WANG, THOMAS WITTEN, The James Franck Institute and The Department of Physics, The University of Chicago — We use the angular deficit scheme[1] to determine numerically the distribution of Gaussian curvature in developable cones(d-cones)[2] formed by forcing a flat elastic sheet into a circular container so that the sheet buckles. This provides a new way to confirm the vanishing of mean-curvature[3] at the rim where the sheet touches the container. This angular deficit scheme also allows us to explore the potential role of the Gauss-Bonnet theorem in explaining the mean-curvature vanishing phenomenon. The theorem’s global constraint on curvature resembles the global conditions observed to be relevant for vanishing mean curvature. However, our result suggests that the Gauss-Bonnet theorem does not explain the vanishing of mean-curvature.

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