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Henry Adams* (henry.adams@colostate.edu), **Johnathan Bush**, **Brittany Carr**, **Lara Kassab** and **Joshua Mirth**. *On the nonlinear statistics of optical flow*.

Optical flow is a vector field that encodes the apparent motion of the 2D images in a video. The estimation of optical flow is used for a wide variety of computer vision tasks, such as tracking or motion planning. We study the high-contrast 3×3 optical flow patches from the computer-generated video short *Sintel*, and provide evidence that this dataset is well-modeled by a torus. Our main tools are persistent homology and zigzag persistence, which are popular techniques from the field of computational topology. We show that the optical flow torus model is naturally equipped with the structure of a fiber bundle, which is furthermore related to the statistics of range images patches. (Received December 28, 2018)