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**Collapsing Mechanism of Toroidal droplets**[1] EKAPOP PAIRAM, ALBERTO FERNANDEZ-NIEVES — Water drops in oil phase are always spherical in order to minimize interfacial energy. This is why other drop shapes are rarely seen. This report show that we are able to generate millimeter size drops which are topologically different from the sphere, namely a torus. The torus can be made by rotating an outer oil phase fast enough while pumping water through an oil submerging capillary tip. For large values of the capillary number of the outer fluid we can create a circular jet which becomes a full circle to make a torus drop. The fatness of the torus can be control through the volume of infused water and the location of the capillary tip from the center of rotation. The toroidal droplets always evolve into a spherical shape. The mechanism of this process is very interesting. So far we have classified two types of behaviors. For a skinny torii, break-up occurs followed by a slow evolution towards the spherical shape. For fat torii, however, there is no break-up. In this case, the torus gets fatter as a whole ultimately collapsing into a spherical drop. We have quantified the dimensionless growth rate for these two situations and compared our results with predictions based on the Rayleigh-Plateau instability for the experimental viscosity ration; the comparison suggests that more ingredients must be incorporated to explain our data.

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