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**Dynamics of surface tension driven mixing of an alcohol droplet with water.** RAJ DANDEKAR, ANURAG PANT, BABURAJ PUTHENVEETTIL, Indian Institute of Technology Madras — We study the flow induced by the surface tension driven spreading of an ethanol droplet of radius $r_d$ on the surface of a 5mm water layer, visualizing the flow using aluminium flakes on the surface of the water layer with backlighting and high speed imaging. The concentration of tracer aluminium particles was found to have no effect on the scaling law for spreading.The drop,when brought in contact with the water surface causes a local depression in surface tension ,resulting in a thin circular region to expand radially outwards.We observe that the dimensionless radius of the expanding front ($r^*=r/r_d$) scales with the dimensionless time ($t^*= \mu\ r_d\ /\Delta\gamma$), as $r^*\sim t^{*1/4}$,where $\mu$ is the viscosity of water and $\Delta\gamma$ is the surface tension difference between water and the ethanol droplet.A scaling analysis taking the viscous and the marangoni forces into account explains the observed scaling law.Our observations differ from that in the case of continuous alcohol supply (Sánchez et al.,Phys.Fluids 27, 032003, 2015) where the observed scaling law is $r^*\sim t^{*1/2}$.The expanding front radius reaches a maximum value and then decreases with time.

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