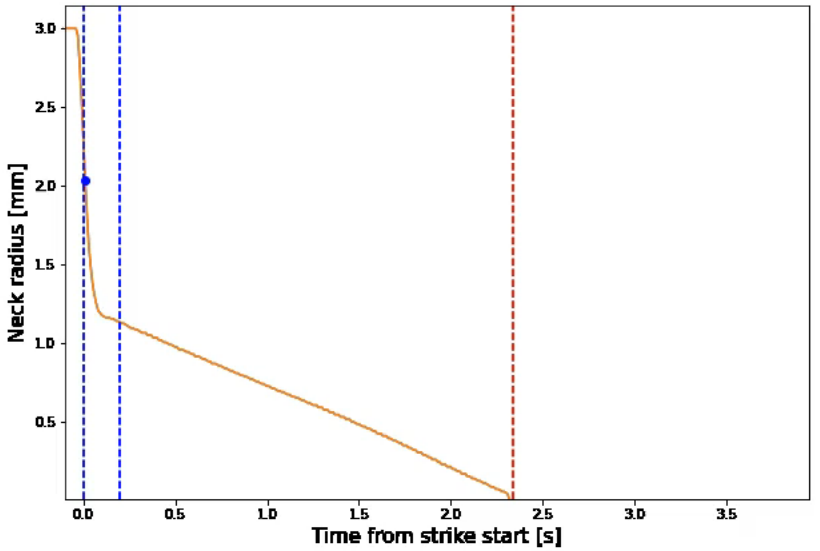
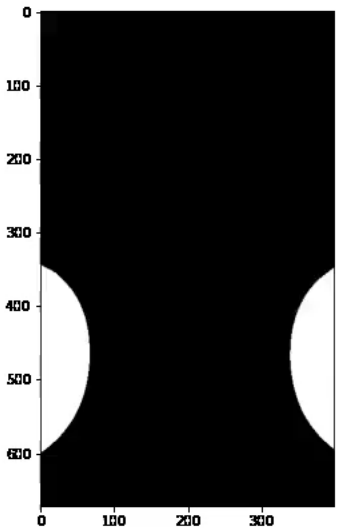
Capillary breakup experiment

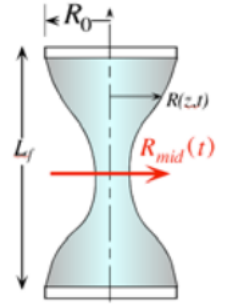
Sample

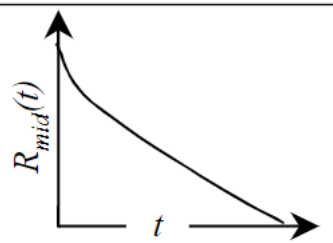
- Viscosity standard 6000cp @20C





Newtonian





$$\frac{R_{mid}}{R_0} = 0.0709\frac{\sigma}{\eta_s R_0}(t_c - t)$$

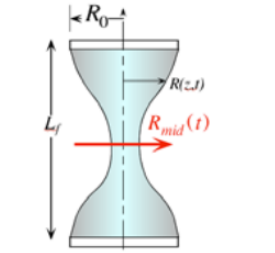
The front factor is determined from the similarity solution for Stokes flow (Papageorgiou, 1995):

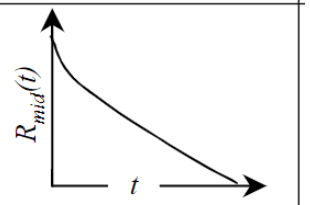
$$t_c = 14.1\,\eta_s R_0/\sigma$$

$$R(t) = 0.0709\frac{\sigma}{\eta}\left(\frac{14.1R_0\eta}{\sigma}\text{-t}\right)$$

```
def newtonian_rt(x,R0=3,sigma_over_eta=1):
    return 0.0709 * sigma_over_eta * (14.1*R0/sigma_over_eta-x)
```

Newtonian



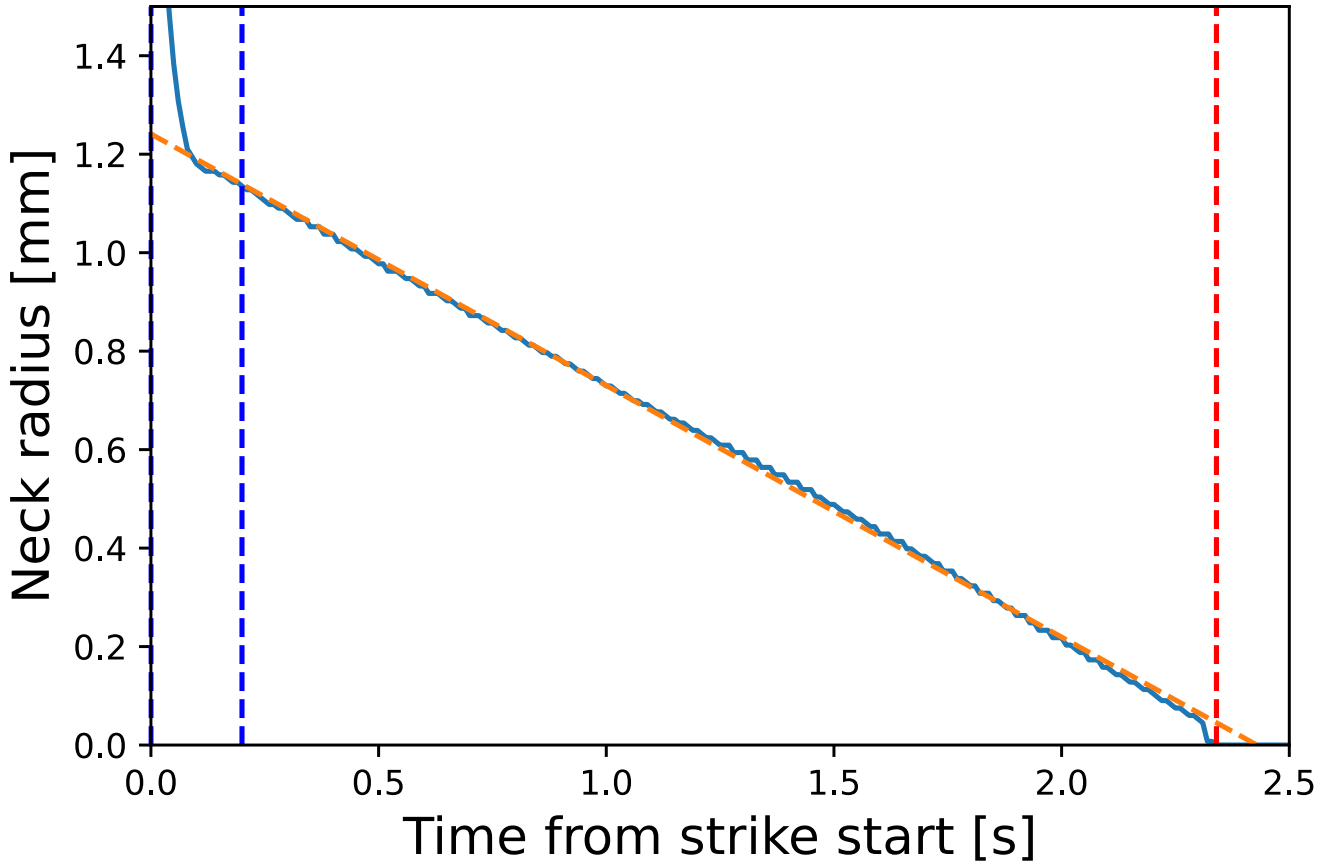


$$\frac{R_{mid}}{R_0} = 0.0709\frac{\sigma}{\eta_s R_0}(t_c - t)$$

The front factor is determined from the similarity solution for Stokes flow (Papageorgiou, 1995):

$t_c = 14.1\eta_s R_0/\sigma$

$\eta = 6\ Pa\ s$
$\sigma = 43.2\ mN/m$



name	value	standard error	relative error	initial value	min	max	vary
R0	1.24147704	0.00139031	(0.11%)	3	-inf	inf	True
sigma_over_eta	7.20658701	0.01400746	(0.19%)	1	-inf	inf	True