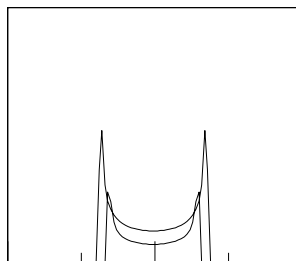
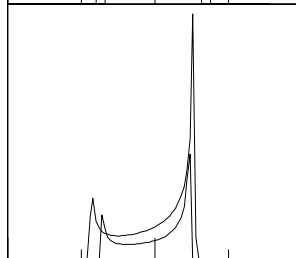


Newtonian



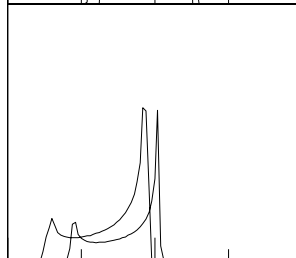
Special relativity



Transverse Doppler shift

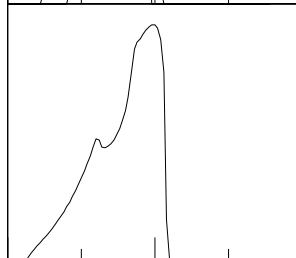
Beaming

General relativity



Gravitational redshift

Line profile



0.5 1 1.5

$\nu_{\text{obs}}/\nu_{\text{em}}$