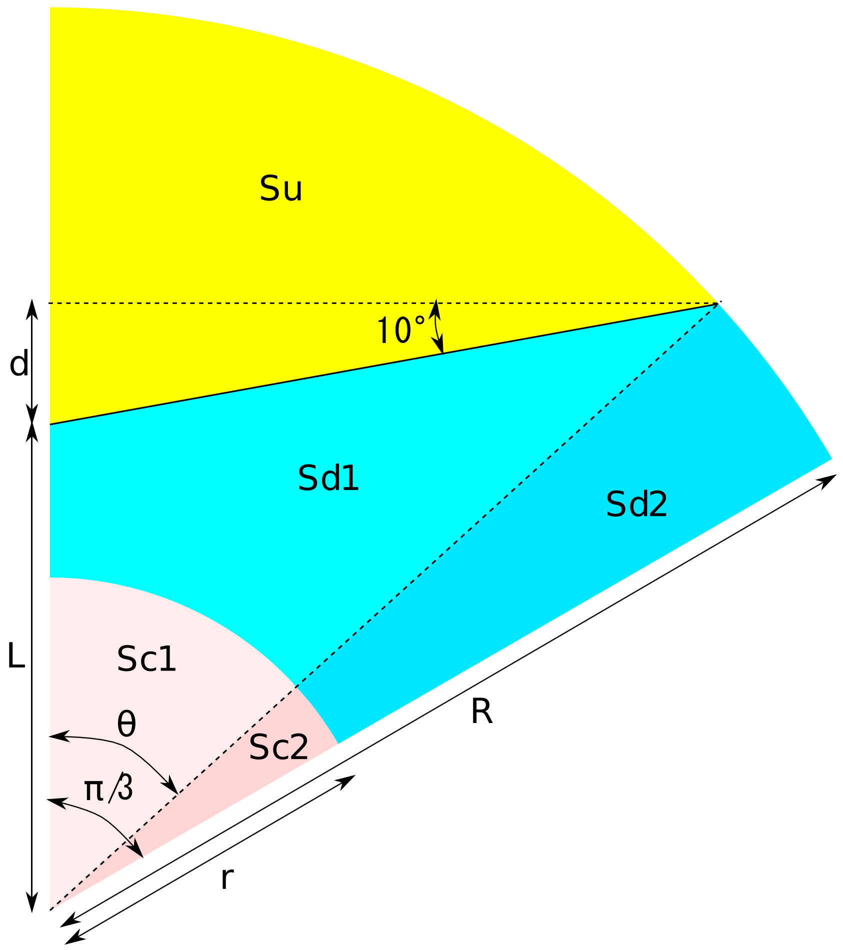
Derivation of the equation to equalize areas of the right upper region and the right lower region of a Tri-Bahtinov mask



$d = R*\sin\theta*\tan 10°$

$L = R*\cos\theta - d = R*(\cos\theta - \sin\theta*\tan 10°)$

$(Su+Sd1+Sd2) = (R*R-r*r)*(\pi/6)$

$(Su+Sd1+Sc1) = R*R*\theta/2$

$(Sc1+Sc2) = \pi*r*r/6$

$(Sd2+Sc2) = (1/2)*R*R*(\pi/3-\theta)$

$(Sd1+Sc1) = (L/2)*R*\sin\theta$

$= (1/2)*R*R*(\sin\theta*\cos\theta - \sin\theta*\sin\theta*\tan 10°)$

$(Sd1+Sd2) = (Sd2+Sc2)+(Sd1+Sc1)-(Sc1+Sc2)$

$=(1/2)*R*R*(\pi/3-\theta+\sin\theta*\cos\theta-\sin\theta*\sin\theta*\tan 10°)-(\pi/6)*r*r$

Equation on θ:

$(Su+Sd1+Sd2) = 2*(Sd1+Sd2)$

$(R*R-r*r)*(\pi/6) = R*R*(\pi/3-\theta+\sin\theta*\cos\theta-\sin\theta*\sin\theta*\tan 10°)-(\pi/3)*r*r$

$(1-r*r/(R*R))*(\pi/6) = \theta-\sin\theta*\cos\theta+\sin\theta*\sin\theta*\tan 10°$