Relationship between θ and t_w

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From the solver parameters the drift $d\nu_{obs}/dt_D$ is calculated according to

$$\frac{d\nu_{obs}}{dt_D} = \frac{\nu_{res}}{t_{res}} \tan(\theta),$$

where θ is the 2d Gaussian model angle and is between $(0, \pi)$, and ν_{res} and t_{res} are the spectral and time resolutions of the burst waterfall, respectively. Then from eq (7) of Rajabi et al. we find

$$\begin{aligned} -\frac{\nu_{res}}{t_{res}} \tan(\theta) &= \frac{A}{t_w}, \\ \tan(\theta) &= -\frac{t_{res}}{\nu_{res}} \frac{A}{t_w}, \\ \theta &= -\arctan(A'/t_w). \end{aligned}$$

In order to match the range of θ and $\arctan(\theta)$ we transform θ according to

$$\theta' = \pi/2 - \theta,$$

so that it is on the interval $(-\pi/2, \pi/2)$