

Design dispersion corrected emittance calculation

$$\begin{aligned}\varepsilon_n &\cong \gamma * (\sigma_{0y}^2 + \eta_y^2 * \delta_{yRMS}^2) / \beta_y \\ &= \gamma * (\sigma_{0y}^2 / \beta_y) + \gamma * (\eta_y^2 * \delta_{yRMS}^2) / \beta_y \\ &= \varepsilon_{on} + \gamma * (\eta_y^2 * \delta_{yRMS}^2) / \beta_y \\ \text{design dispersion corrected emit}(\varepsilon_{on}) &= \varepsilon_n - \gamma * (\eta_y^2 * \delta_{yRMS}^2) / \beta_y\end{aligned}$$

I am obtaining these quantities at the BPMs in following way (after tracking):

```
 $\varepsilon_n$  :  $n_y$  from [S,nx,ny,nt] = GetNEmitFromBPMData( instdata{1} )
```

```
 $\eta_y, \beta_y$  from Twiss functions  
[stat,T] = GetTwiss(1,length(BEAMLINE),Initial.x.Twiss,Initial.y.Twiss)
```

```
 $\gamma_y(i)$  from instdata{1}(i).P/0.000511
```

As for δ_{yRMS} , I am doing

```
 $\delta_{yRMS}(i)$ =sqrt(instdata{1}(i).sigma(6,6))/instdata{1}(i).P
```

