

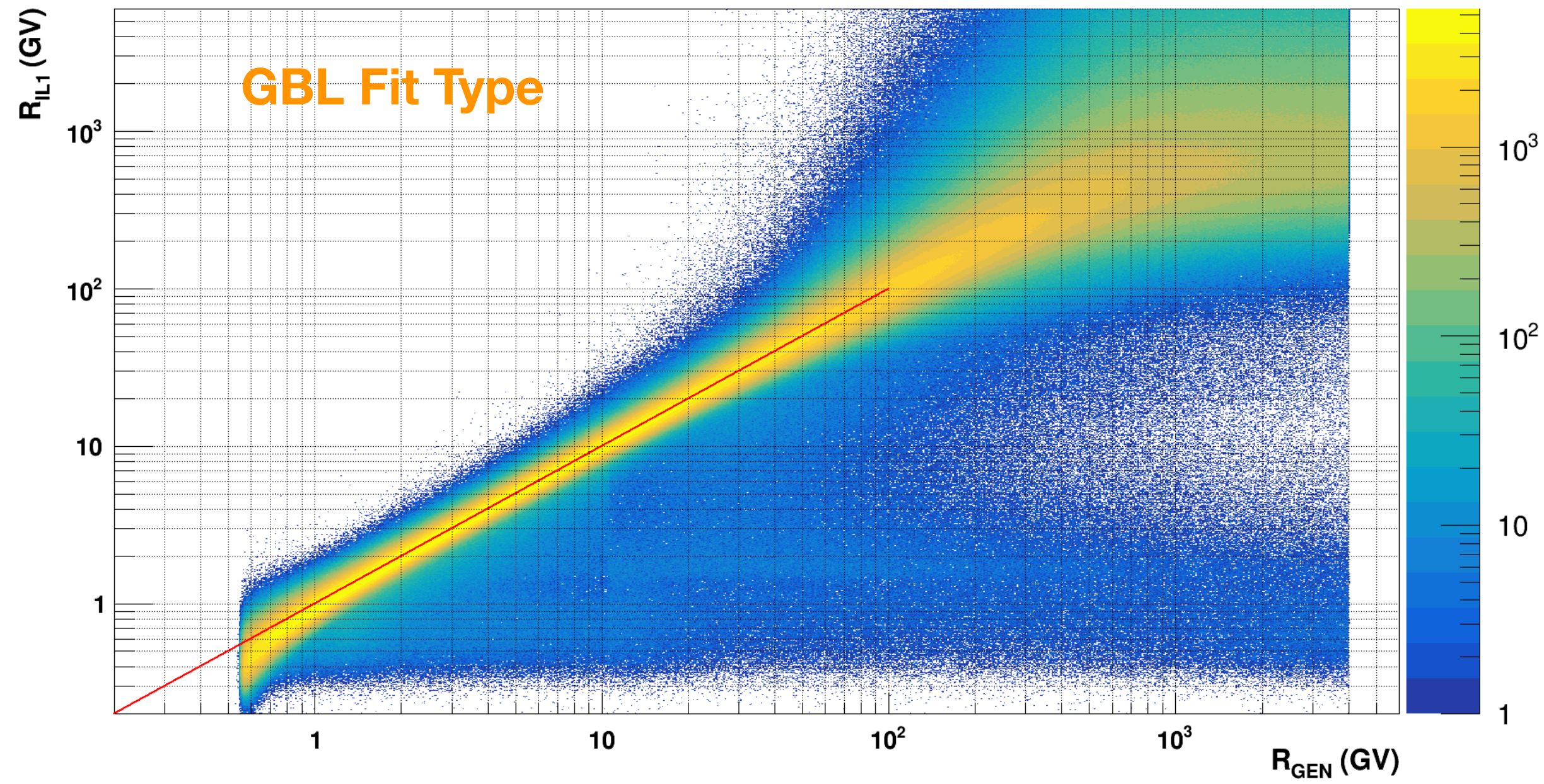
# Corrected Rigidity For Energy Loss

Average Correction From Migration Matrix

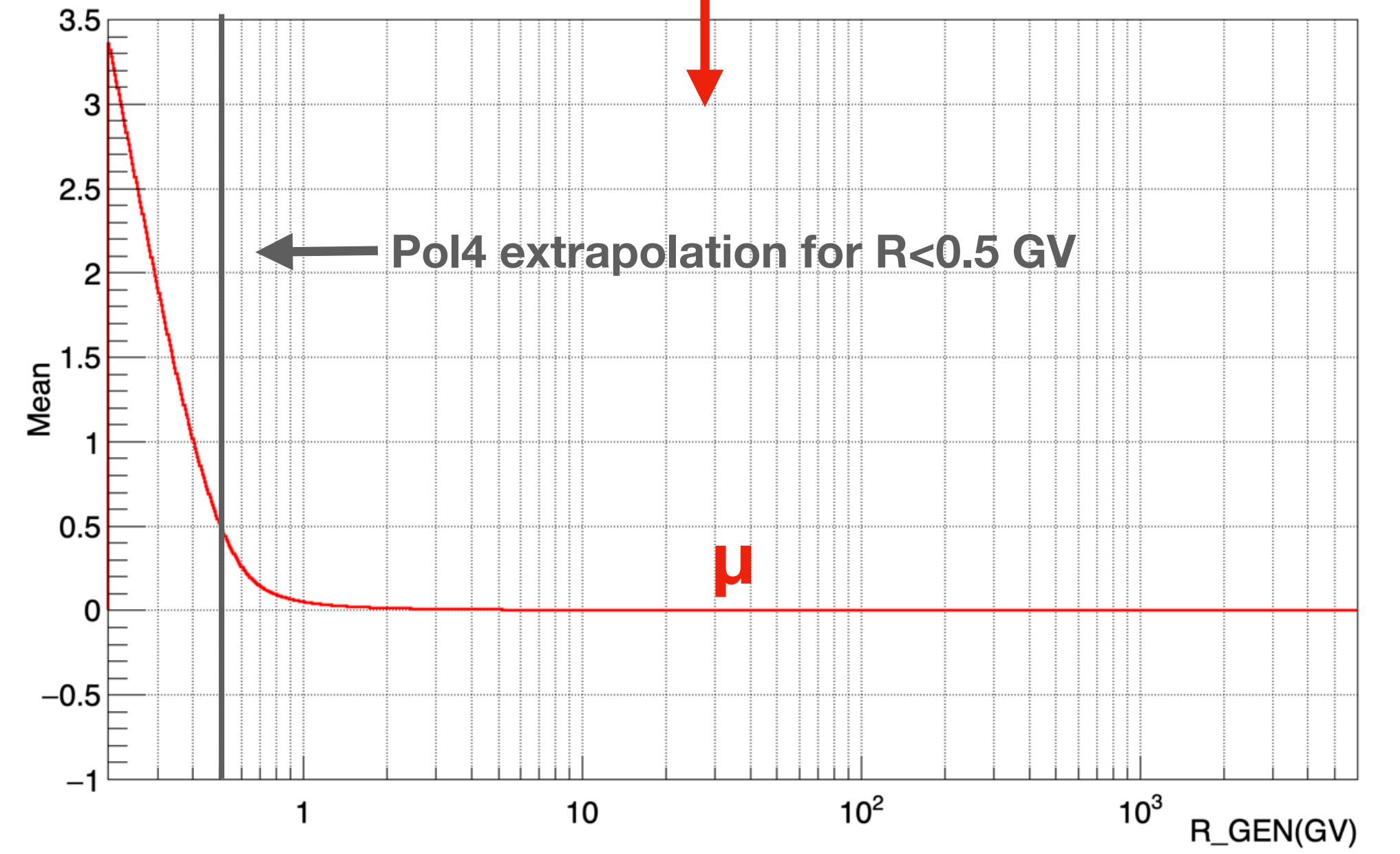
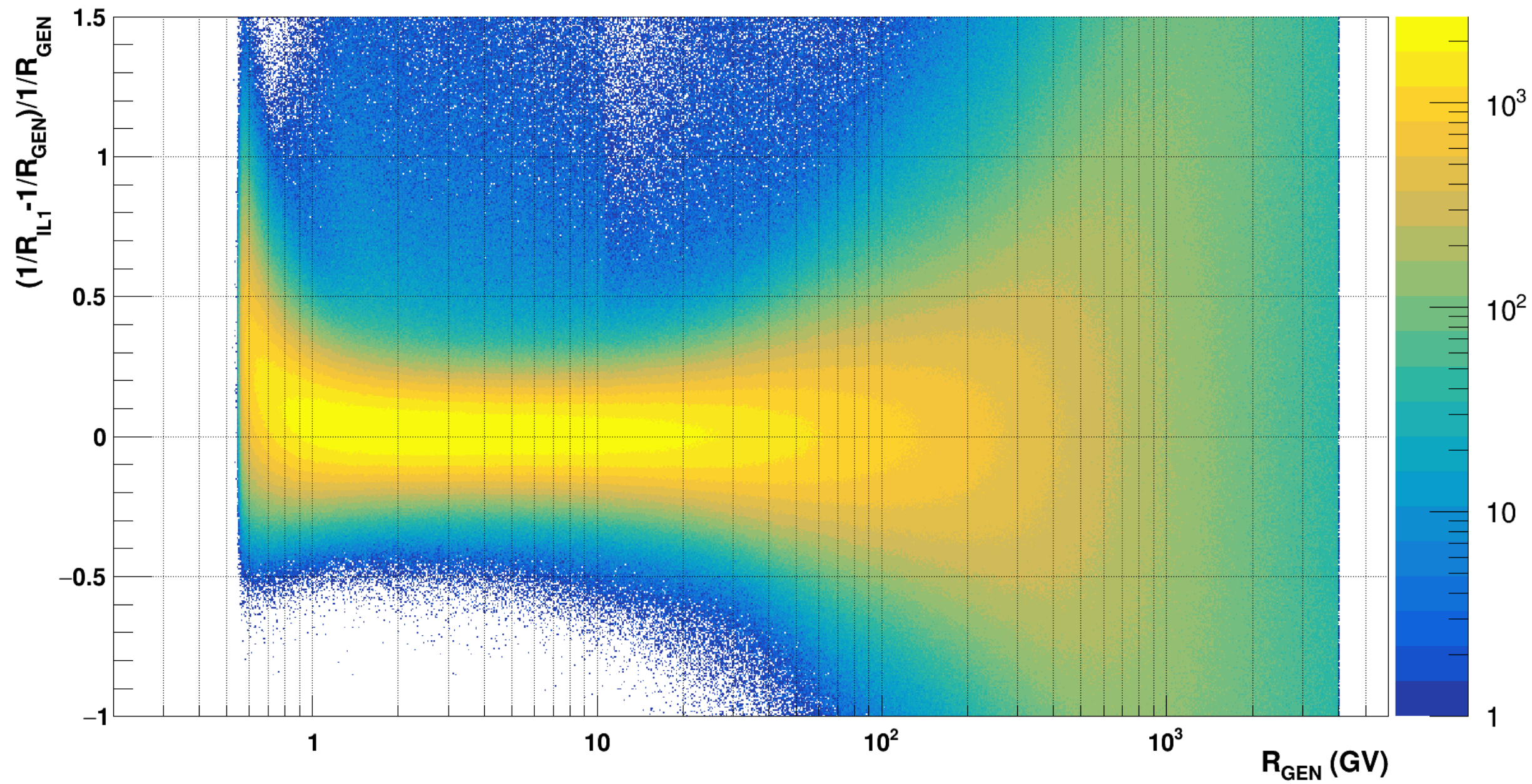
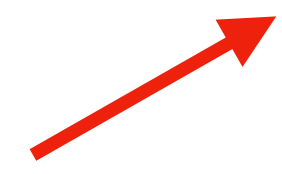
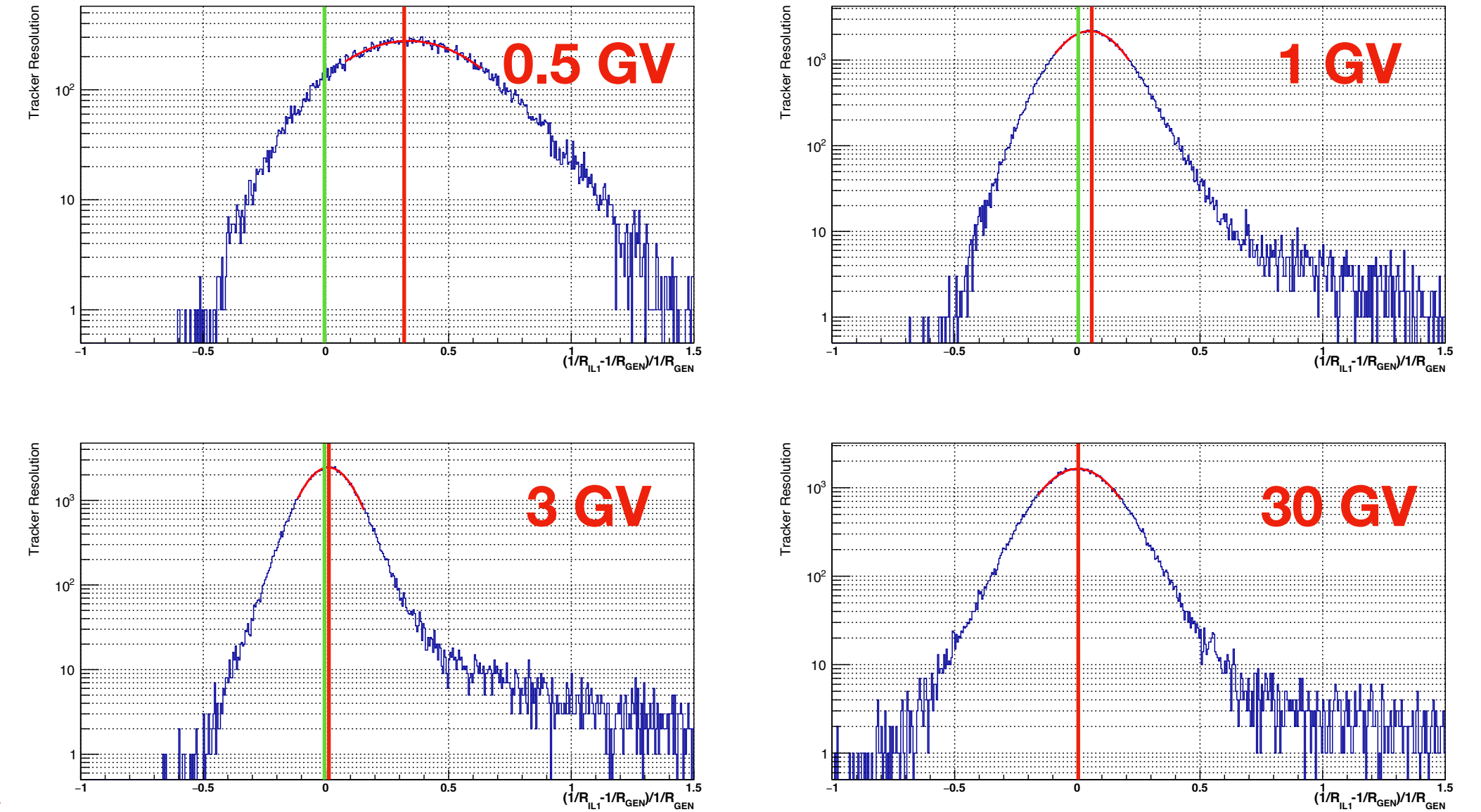
Francesco Faldi



# 1000 Log<sub>10</sub> bins in [0.2, 1000] GV



## Slices fit with gaussian





## Correct GBL rigidity for Energy Loss:

Calculate  $R_{TRUE}$  using just  $\mu$  and  $R_{IL1}$ .  $R_{TRUE}$  will then be our corrected  $R_{IL1}$

$$\mu(R_{TRUE}) = \left\langle \frac{\frac{1}{R_{IL1}} - \frac{1}{R_{TRUE}}}{\frac{1}{R_{TRUE}}} \right\rangle \Rightarrow R_{TRUE} = R_{IL1} \times (\mu(R_{TRUE}) + 1)$$

Use Newton's root finding method to solve for  $R_{TRUE}$ , with  $R_{IL1}$  as fixed point.

The Newton's method is an iterative algorithm which requires the first derivative, as follows:

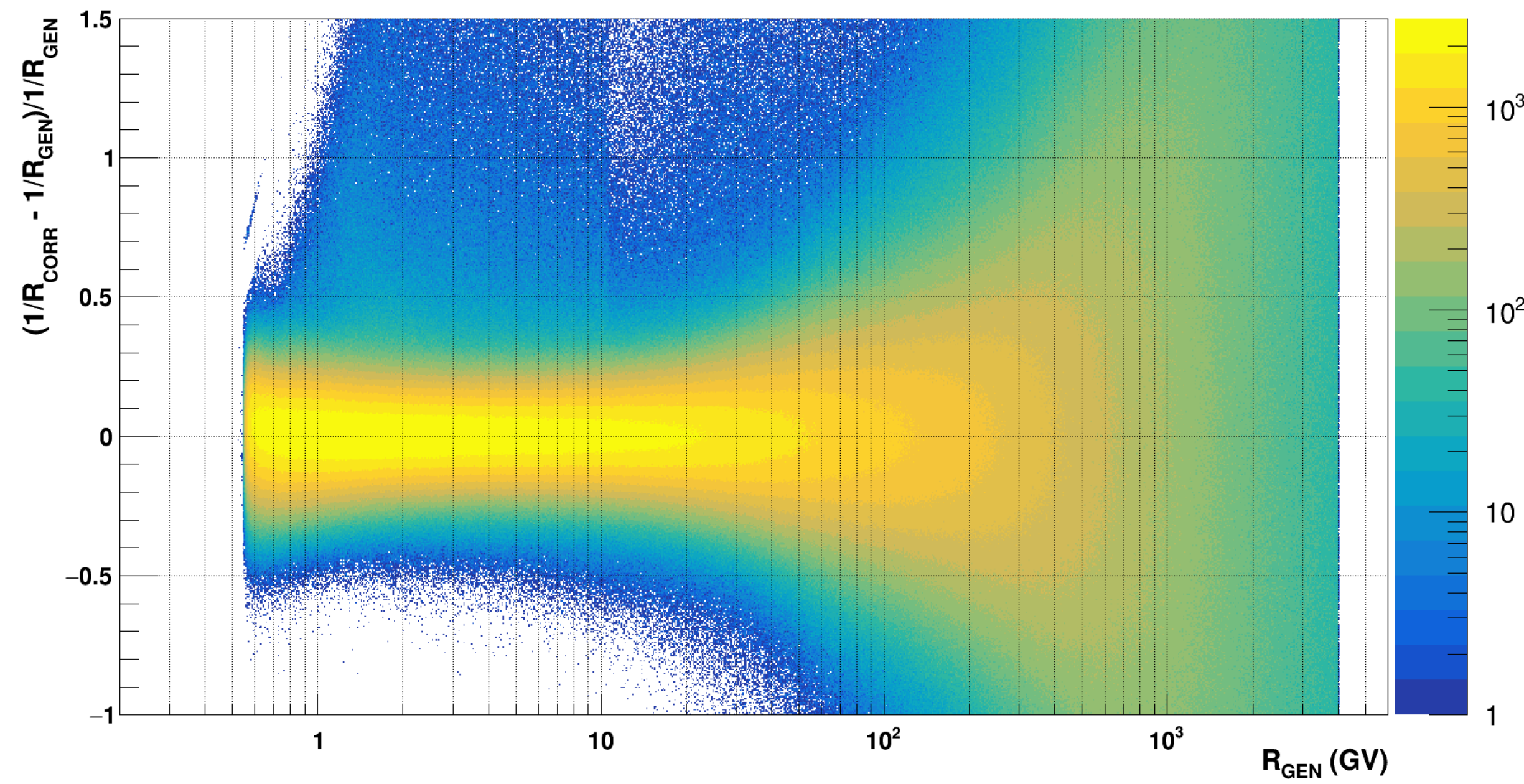
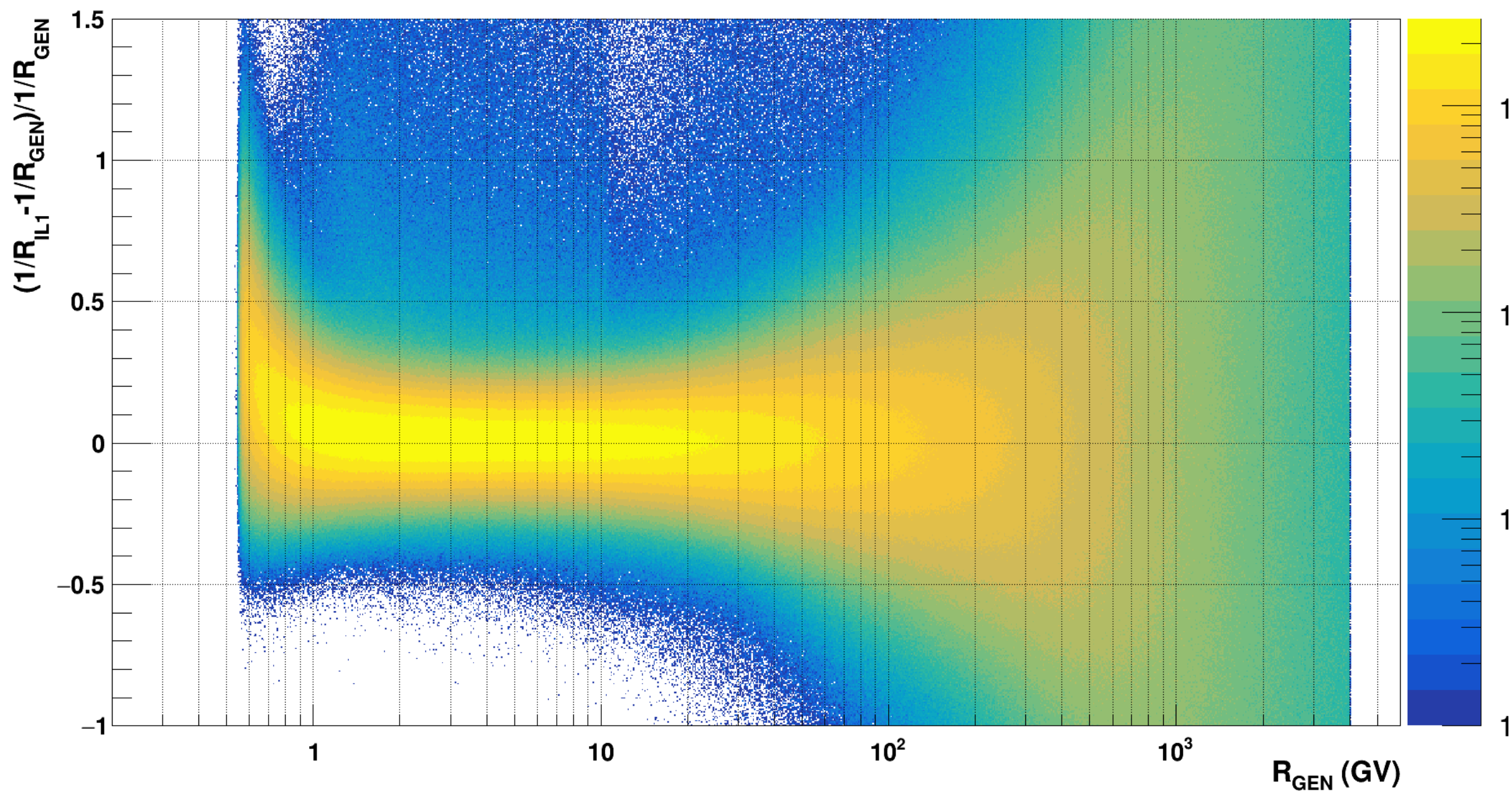
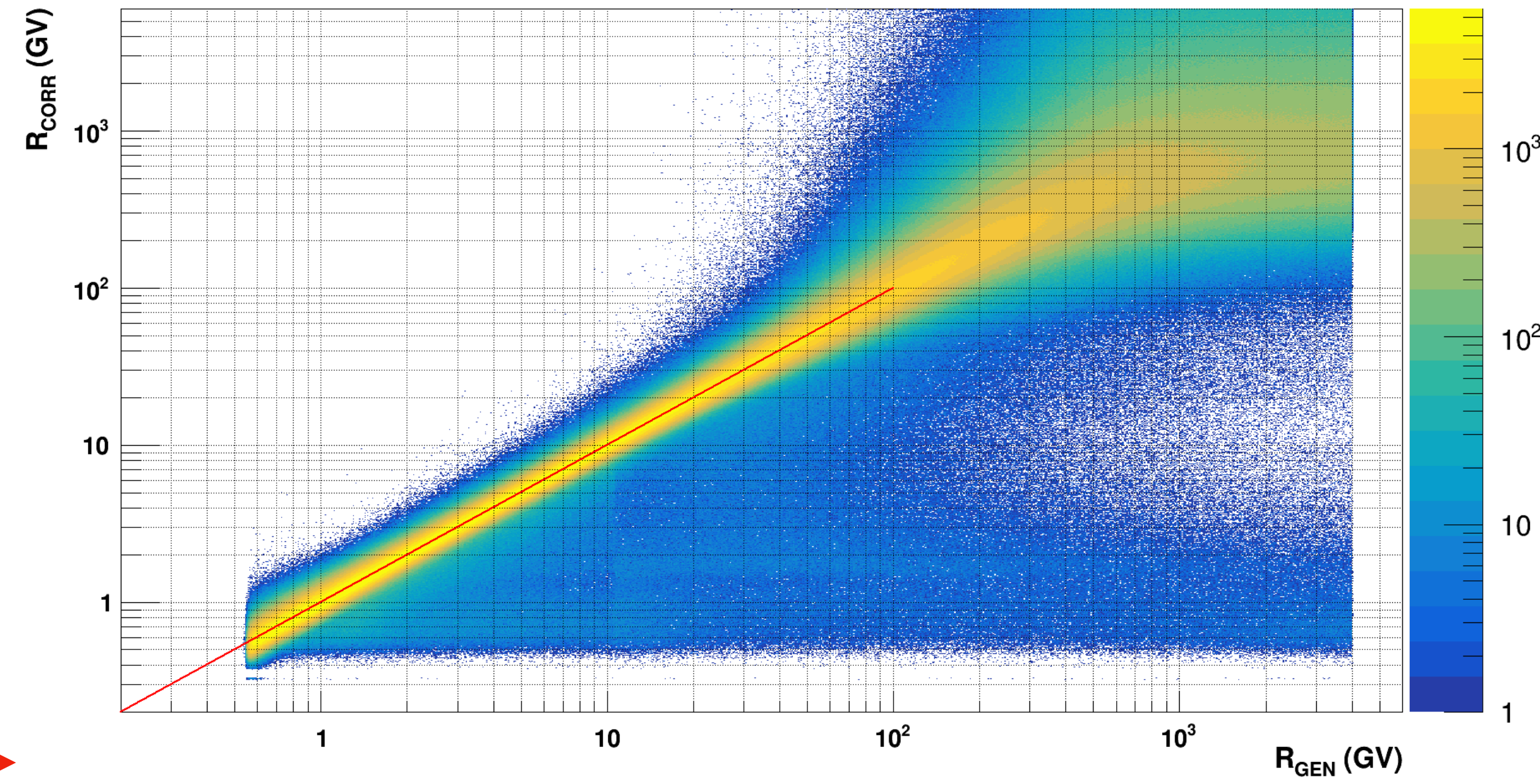
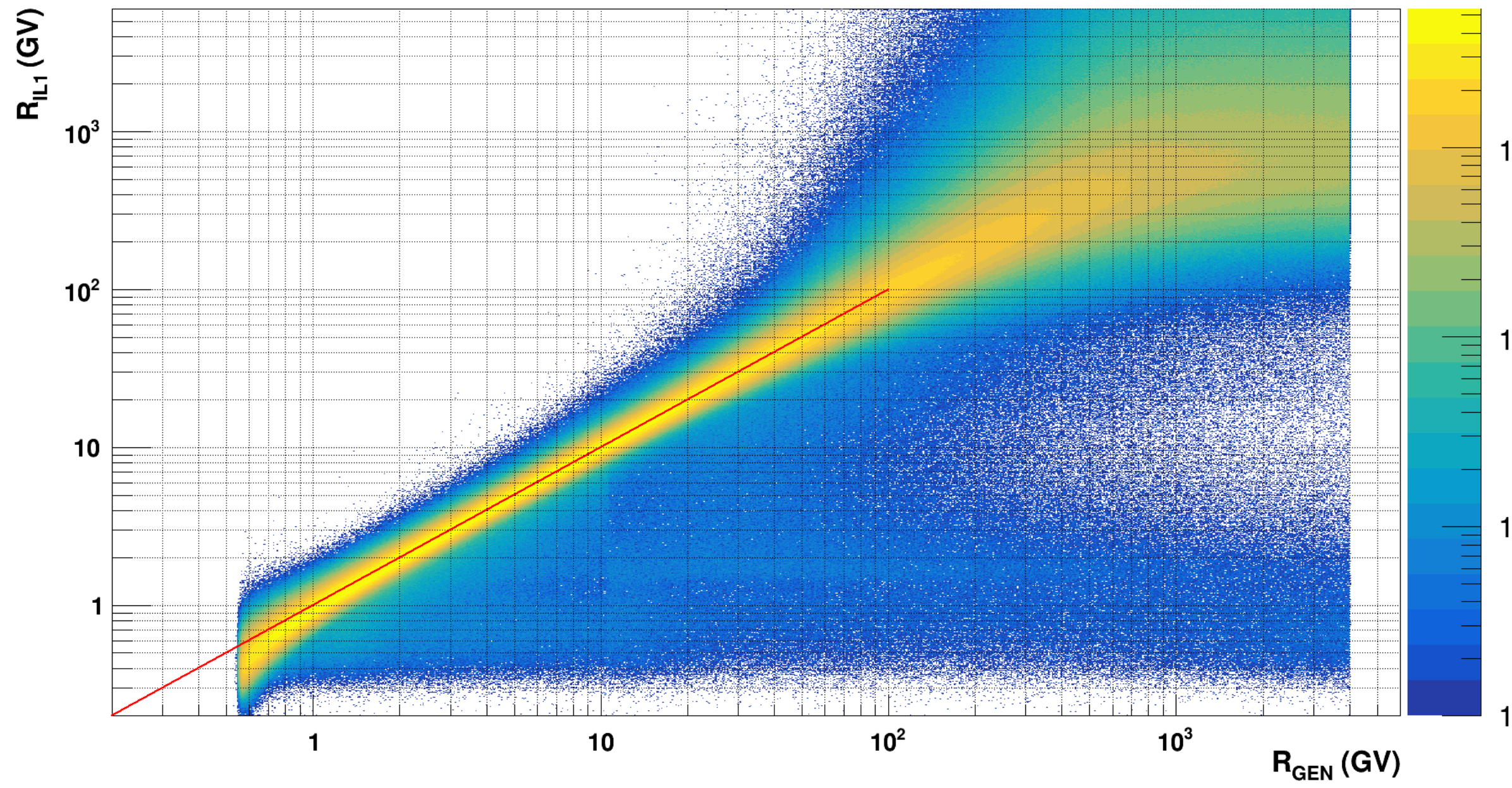
$$\begin{cases} f(R_{TRUE}) = R_{IL1} (\mu(R_{TRUE}) + 1) - R_{TRUE} = 0 \\ f'(R_{TRUE}) = R_{IL1} \mu'(R_{TRUE}) - 1 = 0 \end{cases}$$

$$R_{TRUE}^n = R_{TRUE}^{n-1} - \frac{f(R_{TRUE}^{n-1})}{f'(R_{TRUE}^{n-1})}$$



### Measured Rigidity

### Corrected Rigidity





# Corrected Proton Rate

