

# How $\chi^2$ is defined

The  $\chi^2$  is formed using the residuals between the fit and thrown parameters:

$$\chi^2 = (\Delta p_t / p_t)^2 + (\Delta \theta)^2 + (\Delta \phi)^2$$

If the components are independent and drawn from a Gaussian parent distribution, this would follow a “chi-squared” distribution with a well-known probability distribution