Error propagation for logarithims

1. Generic derivation

Given an observation o we can write it as

$$o = v \pm err$$

where v is our measured value and err is the instrument tolerance

$$\log_b(o) = \log_b(v + err)$$

by differentiating the error portion we get the general formula for any base b logarithim

$$\log_b(o) = \log_b(v) \pm \frac{1}{\ln(b)} \frac{err}{v}$$