

1 Calculations

$$\Delta\epsilon = \frac{d\epsilon}{dt} + \frac{d\epsilon}{d^\circ} + \frac{d\epsilon}{dT} + \frac{d\epsilon}{ddt} + \frac{d\epsilon}{dc} \quad (1)$$

With ϵ describes the BrO Error, t: time between plumetime and referencetime, T, temperaure; dt: daytime, c: colorindex

If we assume a that all differentiations are linear, than we get a equation system :

$$\Delta\epsilon = a_t \cdot \Delta t + a_\circ \cdot \Delta^\circ + a_T \cdot \Delta T + a_{dt} \cdot \Delta dt + a_c \cdot \Delta c \quad (2)$$

Hereby are the constants

a_t	
a_\circ	
a_T	
a_{dt}	
a_c	

2 Error as a function of Plume-Time and Reference Time

As one can assume the mean BrO error raises with the time difference between the Plume and the reference.

picture

One can observe that a possible time interval where the values of the BrO errors are still acceptable is about 3 days, otherwise the values of the calculated BrO are in the majority negative due to instrument drifts. The following figures show how the data changes with the maximum time difference of 3 days - 72 hours