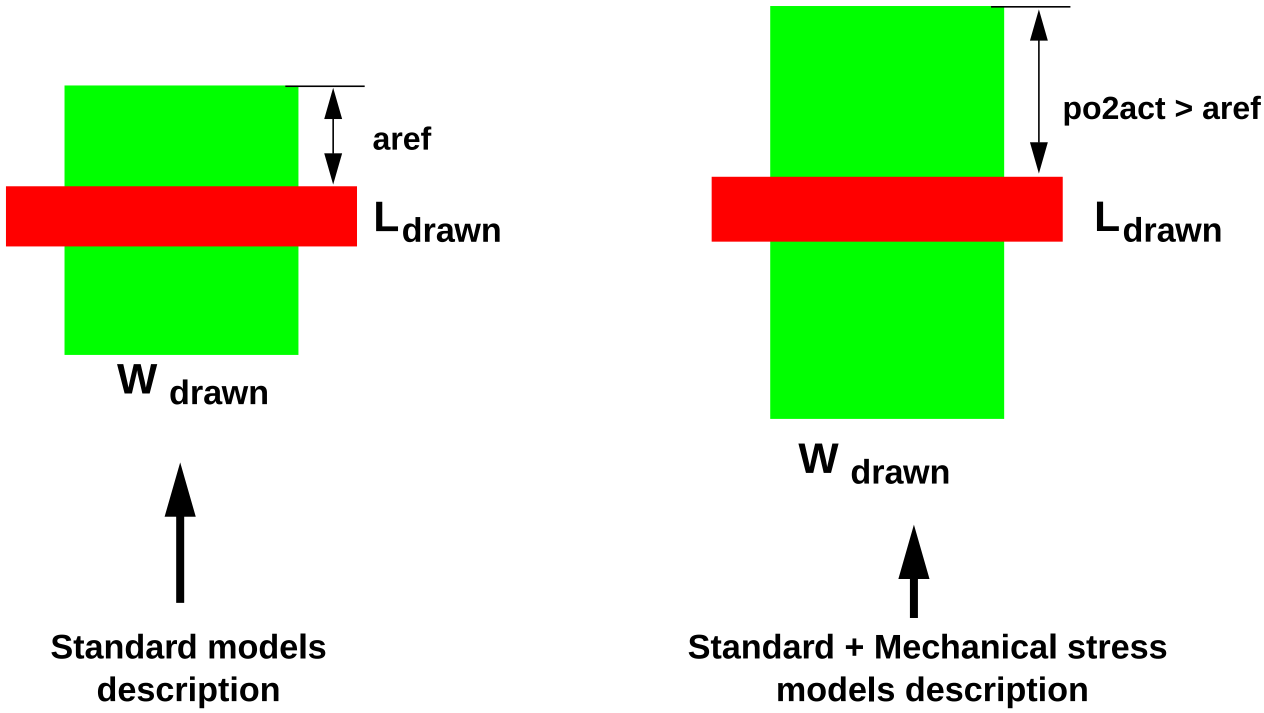
MECHANICAL STRESS MODELS

1. PRINCIPLE

Mechanical Stress models are based on the variation of the poly to active distance (see graph below).



2. APPLICATION

This model is dedicated to take into account the variations of the electrical characteristics of the MOS transistor when the poly to active distance varies.

3. NOMENCLATURE

No special nomenclature is dedicated to Mechanical Stress models. Indeed these models are applied to all models present in the model card.

One new instance parameter has been added in order to define the poly to active dimension: po2act (see schema above).

- Examples:

  XM1 D G S B NLVTLP W=10 L= 0.5 po2act = 0.8

  XM2 D G S B PLVTLP W= 5 L= 0.25 po2act = 3

If po2act is not present in the instantiation line, Mechanical stress models are not active. Therefore models are the standard models corresponding to po2act=aref where aref is the nominal distance between poly and active edges (cf. DRM).

4. MULTI FINGER MOS TRANSISTORS

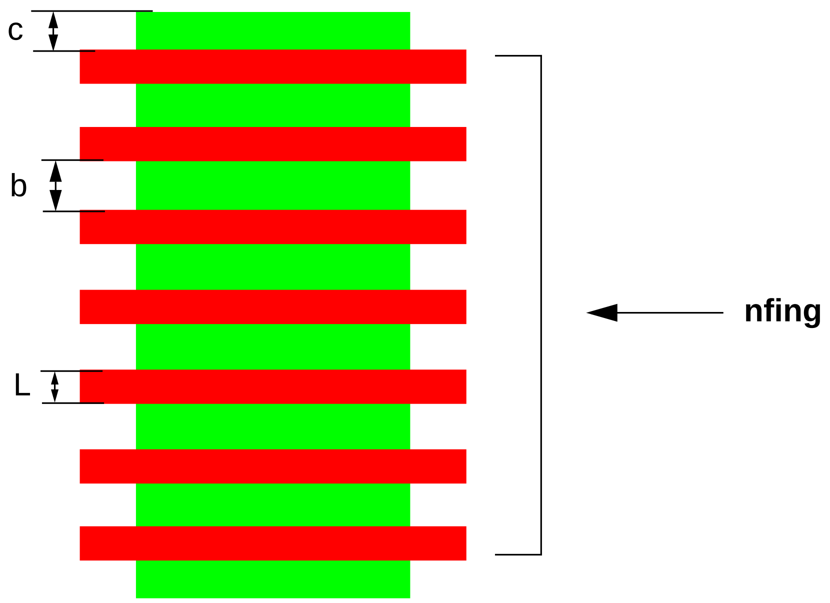
Concerning multifingered MOS transistors, Mechanical Stress models are also available.
To activate these models, one has to put the number of fingers nfing in the instantiation line of the concerned MOS transistor.

- Examples:

  XM1 D G S B NLVTLP W=10 L= 0.5 nfing = 3

  XM2 D G S B PLVTLP W= 5 L= 0.25 nfing = 6

In this case an equivalent poly to active (po2act_eq) distance is calculated for each multifingered MOS transistor and Mechanichal Stress models are then activated.



The equivalent poly to active idstance is calculated as :

$$\text{po2act\_eq} = c\left[1 + \frac{nfing - 1}{1 + 2.5\left(\frac{c}{b + L}\right)}\right]$$