

## Statements related to varying parameters

The SEQUEL GUI allows element parameters to be set with the “property editor.” In addition, it is sometimes desirable to vary a parameter of a given element from a starting value to an ending value inside a solve block. For example, in generating the  $I$ - $V$  curve of a device, we would like to vary the voltage across the device and record the current. The following statements may be used to vary parameters.

\* `vary_parm S1_of_S2 from R1 to R2 type=linear n_points=I1`

(S1,S2: strings, I1: integer, R1,R2: real numbers)

corresponds to the GUI statement `vary parameter (NPoints)`. This statement is used to vary a real parameter of an element from R1 to R2 in a linear fashion. The parameter name is given by S1, and the element name by S2. The number of parameter values is specified by I1.

For example, `vary_parm vdc_of_Vs from 0 to 5 type=linear n_points=51`

can be used to vary the parameter `vdc` of the element `Vs` from 0 to 5. Since `n_points` is specified as 51, the interval  $(5 - 0)$  is divided into  $(51 - 1)$  intervals (i.e., each interval equal to 0.1), and the parameter is varied as 0, 0.1, 0.2,  $\dots$ , 4.9, 5.0.

\* `vary_parm S1_of_S2 from R1 to R2 type=log n_points=I1`

(S1,S2: strings, I1: integer, R1,R2: real numbers)

corresponds to the GUI statement `vary parameter (NPoints)`. This statement is used to vary a real parameter of an element from R1 to R2 in a logarithmic fashion. The parameter name is given by S1, and the element name by S2. The number of parameter values is specified by I1.

\* `vary_parm S1_of_S2 type=table R1 R2 R3 ...`

(S1,S2: strings, R1,R2,R3,...: real numbers)

corresponds to the GUI statement `vary parameter (NPoints)`. This statement is used to vary a real parameter of an element. The parameter values to be assigned are given by R1, R2, R3,... The parameter name is given by S1, and the element name by S2. Note that `n_points` is not relevant in this case.

\* `vary_parm S1_of_S2 from R1 to R2 type=linear div=R3`

(S1,S2: strings, R1,R2,R3: real numbers)

corresponds to the GUI statement `vary parameter (Div)`. This statement is used to vary a real parameter of an element from R1 to R2 in a linear fashion. The parameter name is given by S1, and the element name by S2. The interval between successive parameter values is specified by R3.

For example, `vary_parm vdc_of_Vs from 0 to 5 type=linear div=0.2`

can be used to vary the parameter `vdc` of the element `Vs` from 0 to 5. Since `div` is specified as 0.2, the parameter is varied as 0, 0.2, 0.4,  $\dots$ , 4.8, 5.0.

**Note:** The `vary parameter` statement is not allowed in transient and SSW simulation.