



ÉCOLE NATIONALE SUPÉRIEURE D'INGÉNIEURS DE CAEN
& CENTRE DE RECHERCHE

SPICE 3F5 HICUM Model STATUS

- * Tj Clamping (for convergency issue)**
- * Validation vs Hicum Reference Stand Alone (...5Digits)**
- * Hicum Model with External Power Node (5 ext nodes)
(not compatible with standard SPICE 3 F5)**
- * Beta version of Hicum model for Harmonic Balance
that include now also Circuit Envelope Analysis ...
(not compatible with standard SPICE 3 F5)**
- * some demand for Free source for no commercial usage ...**
- * some demand for commercial usage :
nothing positive today**
- * Data & Info sent to CADENCE / MENTOR :
(after HICUM Workshop June 2002)
=> no acknowledge , no answer , no comments**

*** New Work :**

**Evaluate problem convergency , when TRAN analysis , on
specific circuit that have convergency problem when using
other simulators as :**

- => SPECTRE (CADENCE)**
- => ELDO (MENTOR)**
- => APLAC**



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HARMONIC BALANCE STATUS for SPICE 3F5 (for R.F)

- * New MODELS included in SPICE3F5**
 - * Resistive PORT**
 - * N_PORT**
- * New ANALYSIS included in SPICE3F5**
 - * S-Parameter : give the S Parameters of a Circuit**
 - * HB : Harmonic Balance Periodic Steady State
(1 forced Frequency)**
 - * QP : H.B QUASI Periodic Steady State
(2 unrelated forced Frequency)**
 - * CE : H.B Circuit Envelope Transient
(2 unrelated forced Frequency)**
- * Status of implemented Models for Harmonic Balance :**
 - * R , L , C + VSRC + ISRC + Port => OK**
 - * BJT : Gummel Poon => OK**
 - * BJT : HICUM 2.1 – 4 ext Node => Beta**



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*** New Work :**

Evaluate problem convergency , when TRAN analysis , on specific circuit that have convergency problem when using other simulators as :

=> SPECTRE (CADENCE)

=> ELDO (MENTOR)

=> APLAC

**=> when convergency problem :
(ST info/data comes from Didier CELI)**

**=> 1 ECL circuit that includes a lot of Standard parasitic capacitors :
no problem comes from HICUM model itself ...**

=> a ECL ring oscillator circuit where HICUM BJT are strongly saturated :

=> TRAN run slowly when using SPICE

=> speed up by 10 when using SPICE and when HICUM BJT are not saturated ...

=> speed up by 10 when using SPICE and when Excess Phase in HICUM BJT are not used ...

=> by modifying C source

**=> by setting ALQF = 0.0
(instead of 2.2000E-01)**