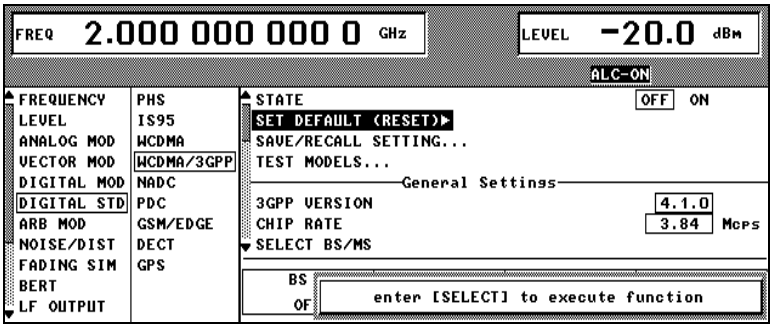
Setting up W-CDMA Scenarios in SMIQB45 by using the Function „Parameterized Predefined Setting“ and adjusting the Crest Factor

For testing base station components (e.g. amplifiers) it is necessary to set up a downlink W-CDMA signal that is spectrally and statistically correct. Furthermore it might be important to influence the crest factor of the signal.
The following text describes how to set up such a W-CDMA test scenario easily (only with few key-strokes) by using the function „Parameterized Predefined Setting“. And how to influence/adjust the Crest Factor of the signal.

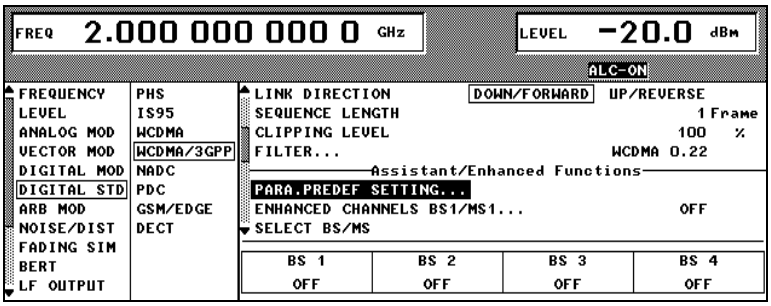
I. Channel setup using menu „Para. Predef Setting“

1



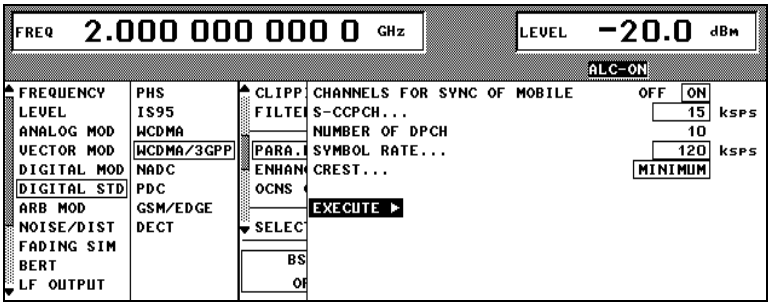
- Set frequency and level
- Go into the menu *DIGITAL STD → WCDMA/3GPP*
- Reset the 3GPP W-CDMA by selecting *SET DEFAULT (RESET)* ►

2



- Scroll down to the section “Assistant/Enhanced Functions”
- Select *PARA. PREDEF SETTING...*

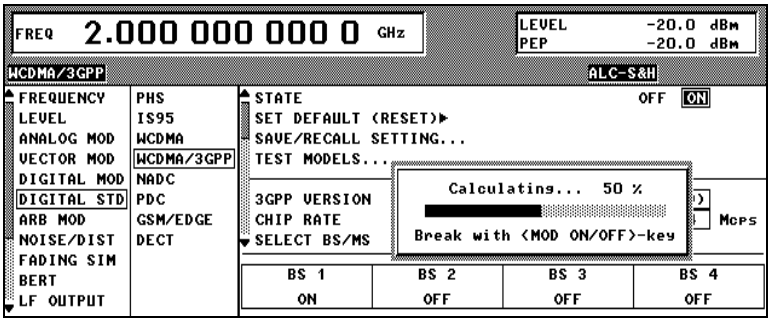
3



- Switch ON/OFF the *CHANNELS FOR SYNC OF MOBILE* (“special channels” for synchronization: P-CPICH, P-SCH, S-SCH, P-CCPCH) if necessary
- Select the symbol rate of the S-CCPCH (can be switched off) and DPCH
- Set the *NUMBER OF DPCH* (maximum number of DCPHs is the ratio of chip rate and symbol rate and so depends on the symbol rate set.
  Example:
  symbol rate of DPCHs: 120 ksps ⇒ max. number of DPCHs = 3.84 Mcps / 120 ksps = 32)
- Select the optimization criterium (MINIMUM, AVERAGE, WORST) of the *CREST* Factor (further details regarding this feature please find below in section III.)

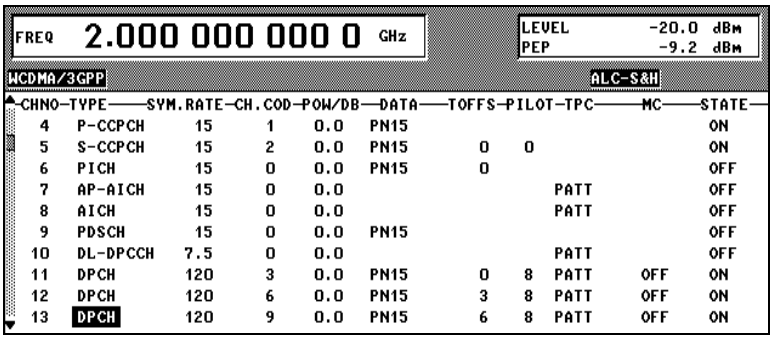
- Select *EXECUTE* ► to finalize your entries
- Go back into SMIQ's W-CDMA main menu by pressing the RETURN key on SMIQ's front panel

4



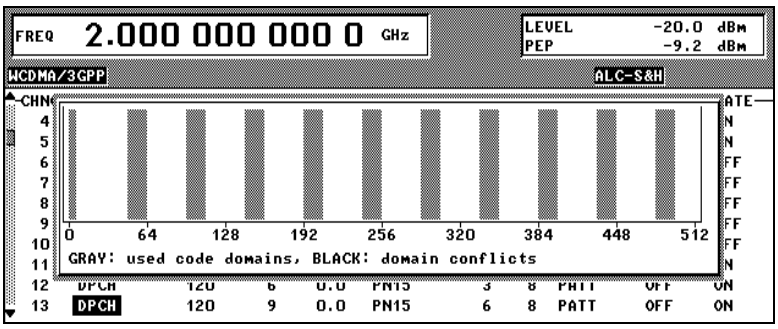
- Switch *STATE* to *ON*: The signal is being calculated
- The W-CDMA signal is now generated

5



- By going into the corresponding base station (BS 1 in this case) the channel table can be seen and parameters can be edited

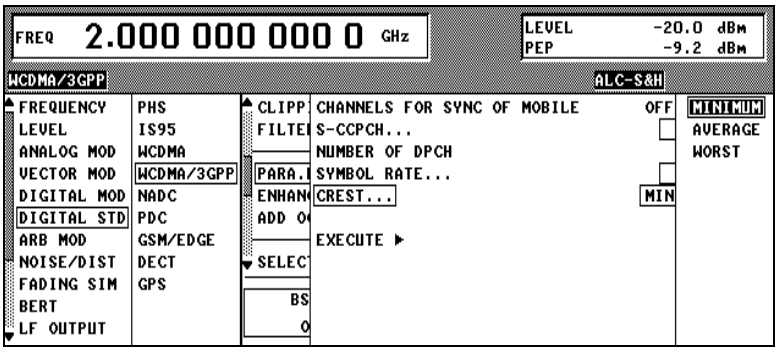
6



- Press the STATUS – key on the SMIQ front panel: the code domain is displayed

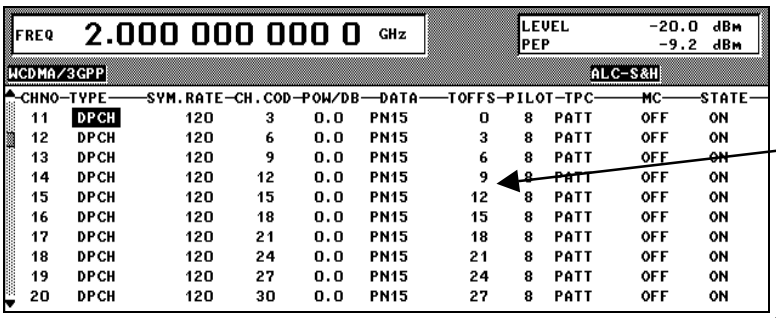
III. Setting the Crest Factor

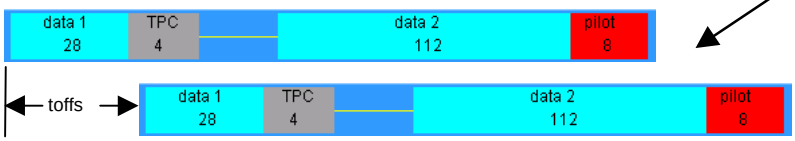
1



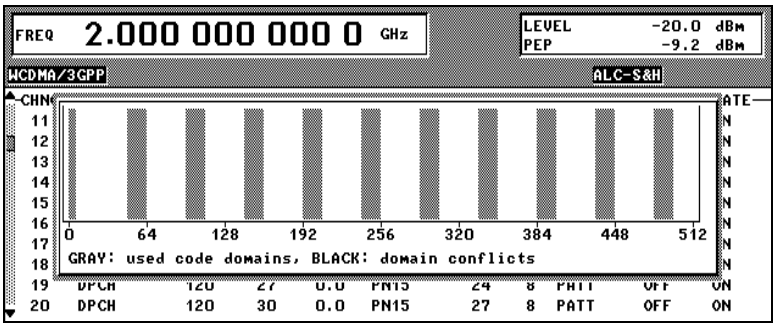
- The crest factor can be modified in three different ways: minimum, average and worst
- Select *MINIMUM*
- Finalize your entries by pressing *EXECUTE* ► and go back to the W-CDMA main menu with RETURN

2



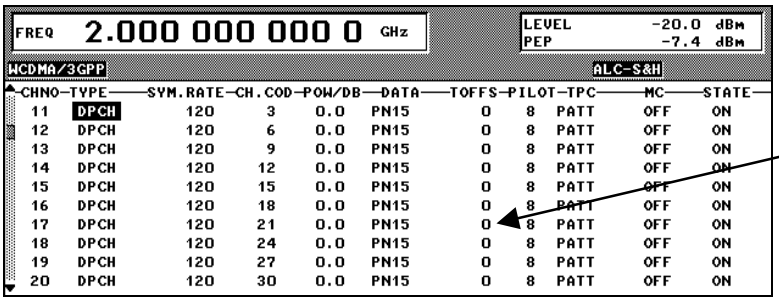


- *CREST... MINIMUM*:
  The channelization codes are distributed uniformally over the code domain. The timing offsets are increased by step of 3 from channel to channel. So the data/pilots start at different positions.

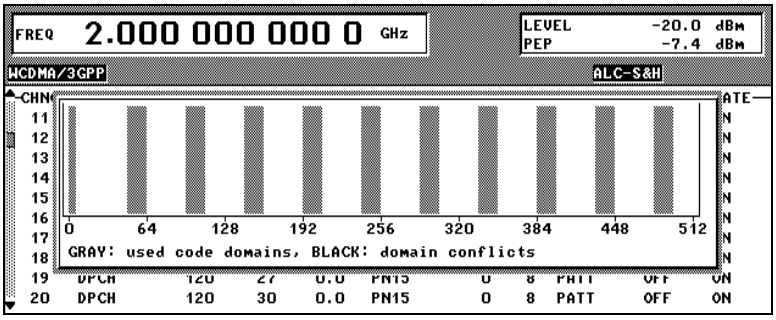


- The code channels are equally distributed over the code domain

3

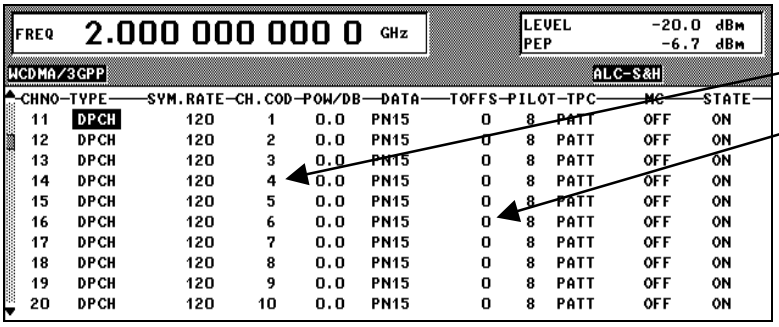


- *CREST... AVERAGE:*
  The channelization codes are distributed uniformally over the code domain. The timing offsets are all set to 0.

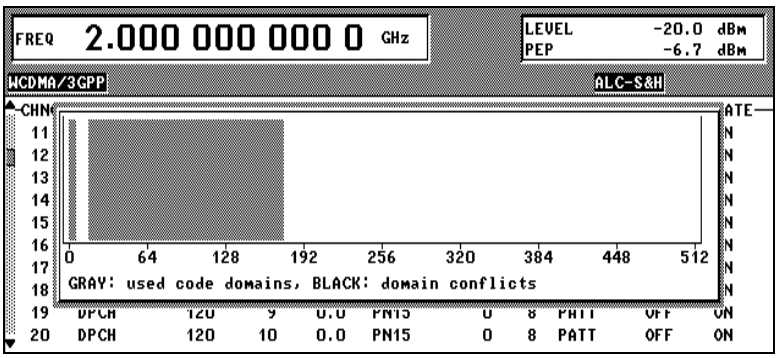


- The code channels are equally distributed over the code domain. The influence of TOFFS = 0 for all code channels cannot be seen from this display

4

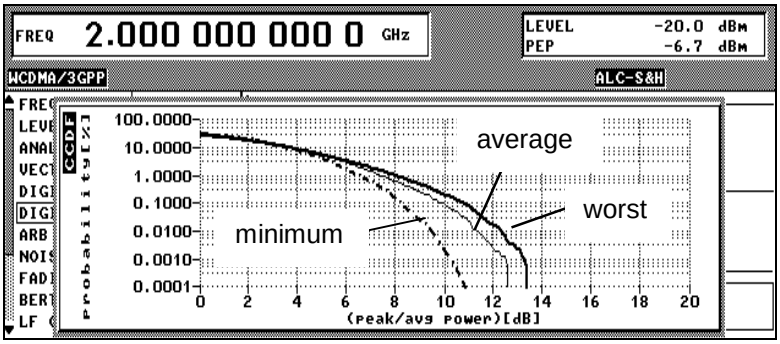


- *CREST... WORST:*
  The channelization codes are assigned in ascending order. The timing offsets are all set to 0.



- As the channelization codes are assigned in ascending order the code channels are not equally distributed over the code domain

5



- Plot the CCDF curve after setting each CREST optimization method
- The three crest factors for the example are as follows:
  Minimum: 10.8 dB
  Average: 12.6 dB
  Worst: 13.3 dB