

## Proposal for BPM Data Integrity Checks

R. Michnoff,  
August 28, 2008

1. The most critical system parameter for data integrity checking is Acorr/Bcorr values.
  - Low Threshold value – as indication that
    - o Self-trigger did not occur as expected
    - o Very low beam intensity
    - o No beam in selected bucket
    - o Gain setting should be changed from X1 to X10 (However, if I recall correctly, signal saturation (or overflow) is sometimes measured as 0 – this would indicate that the gain should be changed from X10 to X1).
  - High Threshold value – as indication that
    - o Gain setting should be changed from X10 to X1
    - o Very high beam intensity
2. For average orbit:
  - Omit position measurements with BAD status OR (Acorr/Bcorr out of tolerance)
  - In continuous average orbit mode, return the number of valid values (that is, Acorr/Bcorr within tolerance) in each one (or four) second period.
3. For turn-by-turn:
  - For each measurement in 1024 array:
    - I F (Acorr/Bcorr out of tolerance) OR (invalid self trigger)
    - ~~set the position measurement value to 0~~ (Don't throw away potentially useful data.)
    - set status bit to BAD
4. Alarms/Warnings
  - Beam in machine, but no beam detected in selected BPM bucket (based on Low Acorr/Bcorr for ALL values in average orbit or turn-by-turn data buffer.
  - One or more BAD values (Low or High Acorr/Bcorr values) detected in average orbit data buffer.
  - One or more BAD values (Low or High Acorr/Bcorr values) detected in turn-by-turn data buffer. The case at injection, where the first X turns have no beam needs to be handled appropriately.
  - BAD timestamps