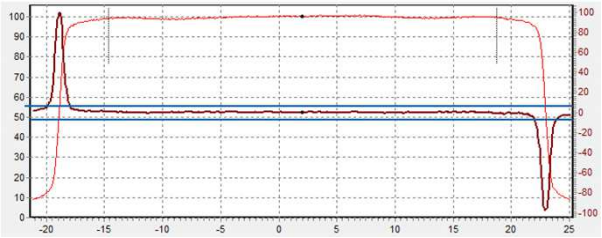
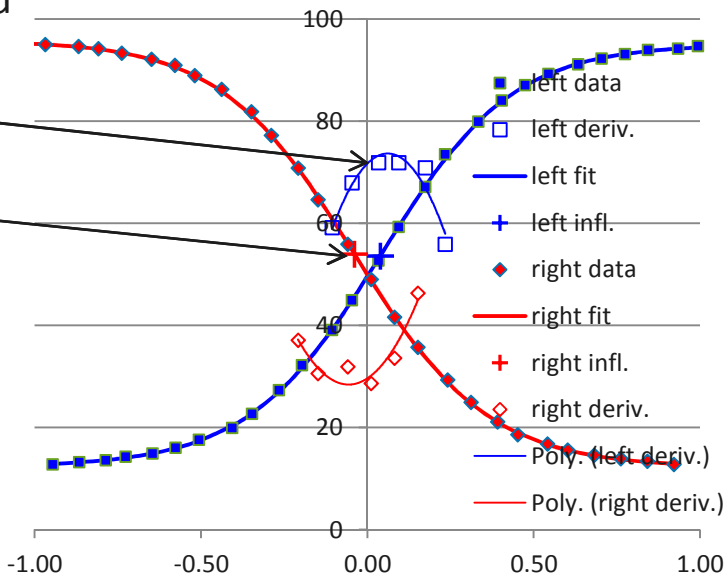
A general approach for field size detection

1) Take derivative
2) Calculate histogram
3) Define “dead band” around largest bin
4) Any maximum and minimum should be outside dead band *and* occur with only one crossing of the dead band.
5) Perform second order polynomial fit on peaks.
6) The position of maximum resp. minimum defines x_{edge}
7) Optionally: fit sigmoid function around found edge
   Note: the inflection point, found with both methods, generally does *not* represent $x_{50\%}$
8) If $x_{50\%}$ differs “too much” from x_{edge} then use x_{edge}





- The method is stable for wedged fields and wide FFF fields where the 50% position clearly is not representative.
- Reliably rejects missing penumbra’s
- No assumptions on field size needed
- Using more data with a good model decreases uncertainty:
  incorporated data linear fit < peak fit < sigmoid fit