

Meeting Report 05.07.19

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2019/07/05

- 1 Protocoll
- 2 Examples
- 3 Cross correlation
- 4 More channels
- 5 Different configuration
- 6 Fit and comparison
- 7 Protocoll

Protocoll

To summarize:

- 1 calculate sensitivity for channels – localistaion
- 2 check whether this is generally applicable or a function of different system variables
- 3 if necessary, focus on detachment experiments where feedback is applied and hence the channel selection does matter
- 4 why is that the case? differences in radiation locals
- 5 applicable conclusions for feedback system

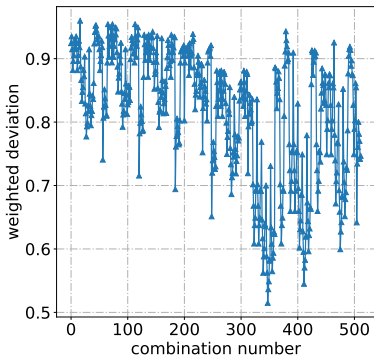
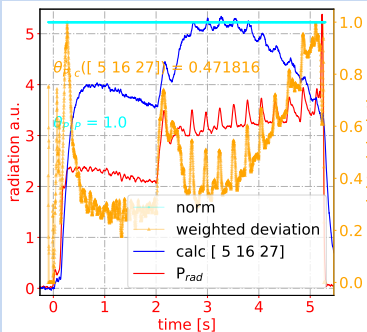
Weighted deviation

$$d_{diff}(t) = \|P_{rad}(t) - P_{prediction}(t)\|$$

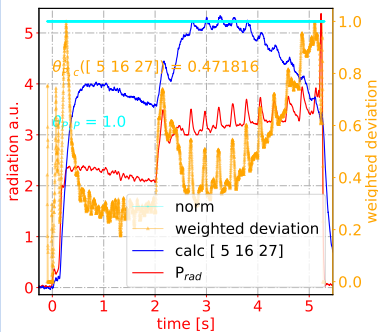
$$\varepsilon(t) = \left\{ \begin{array}{ll} 1 - \frac{d_{diff}(t)}{P_{rad}(t)} & , d_{diff} < P_{rad} \\ 0 & , \text{else} \end{array} \right\}$$

$$\vartheta = \overline{\varepsilon(t)}$$

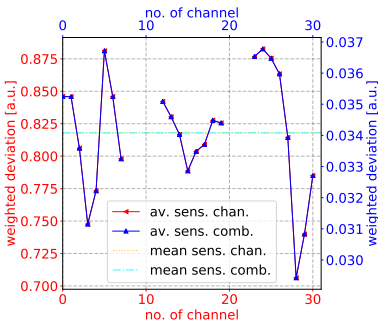
Example and spectrum: feedback 20171207.24 @ EJM



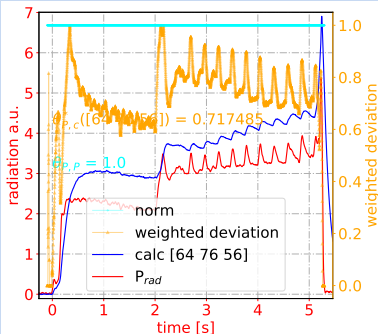
Example and spectrum: feedback 20171207.24 @ EJM



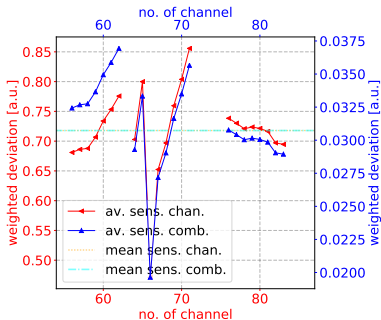
20171207.024 HBC combinations:3



Example and spectrum: feedback 20171207.24 @ EJM



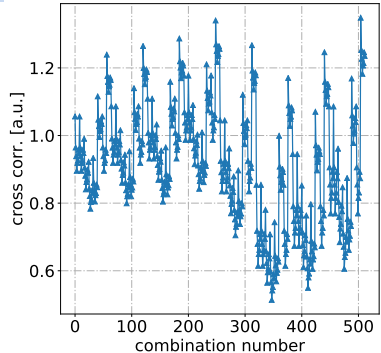
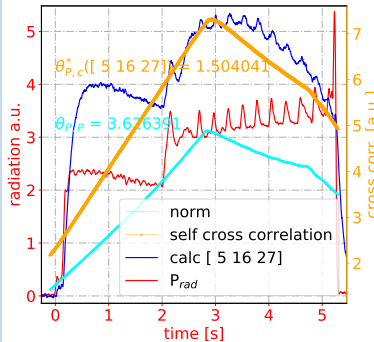
20171207.024 VBC combinations:3



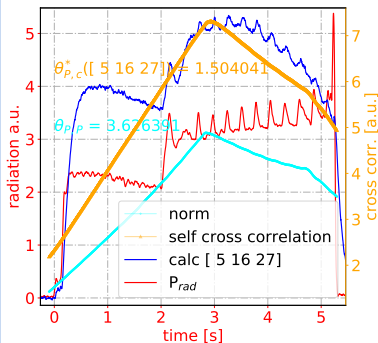
Cross correlation

$$\begin{aligned}C_{corr} &= \int (P_{rad} * P_{prediction})(\tau) d\tau \\ &= \iint P_{rad}(t) P_{prediction}(t + \tau) dt d\tau\end{aligned}$$

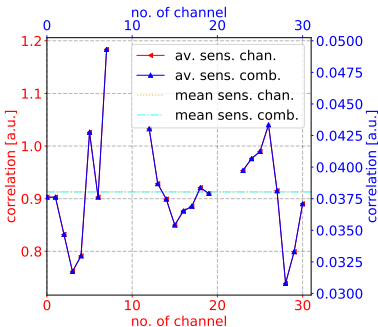
Example and spectrum: feedback 20171207.24 @ EJM



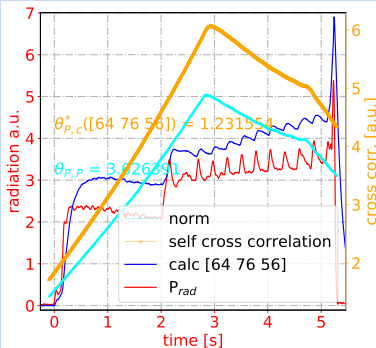
Example and spectrum: feedback 20171207.24 @ EJM



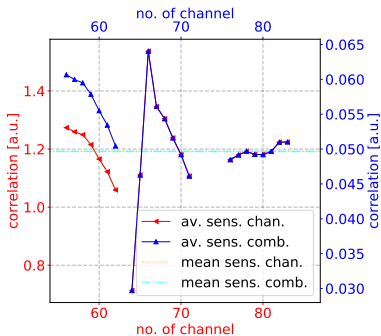
20171207.024 HBC combinations:3



Example and spectrum: feedback 20171207.24 @ EJM



20171207.024 VBC combinations:3

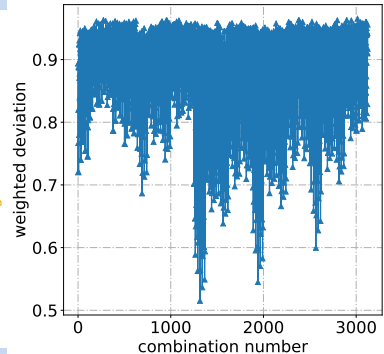
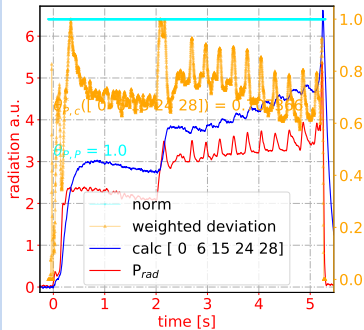


Possible parameter space

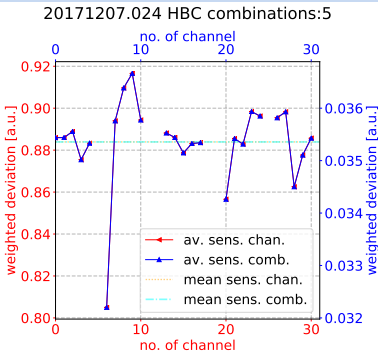
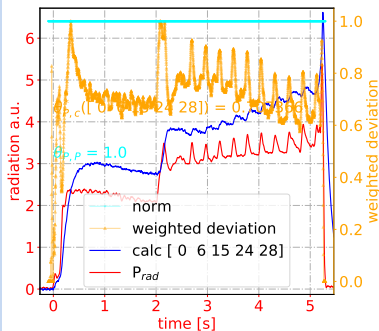
$C = \text{ALL, HBC, VBC and HBC \& VBC}$

$A = 1 \text{ (normalization), } 3, 4, 5, 6, 7, 8, 9$

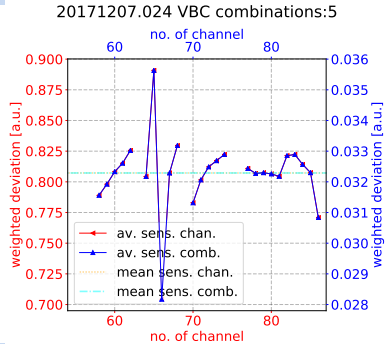
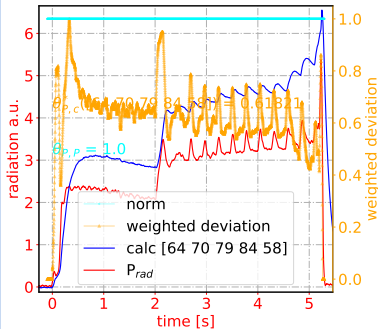
Example and spectrum: feedback 20171207.24 @ EJM



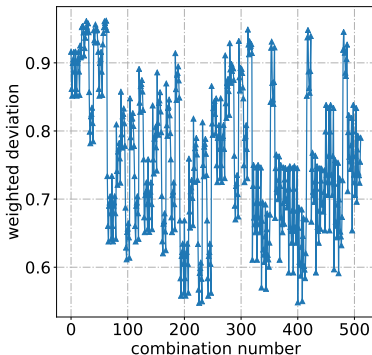
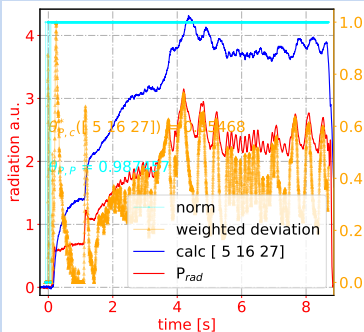
Example and spectrum: feedback 20171207.24 @ EJM



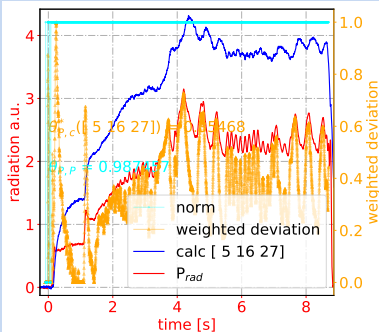
Example and spectrum: feedback 20171207.24 @ EJM



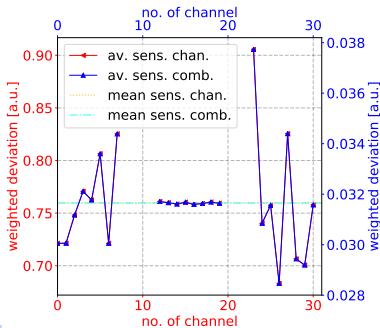
Example and spectrum: feedback 20181009.046 @ KJM



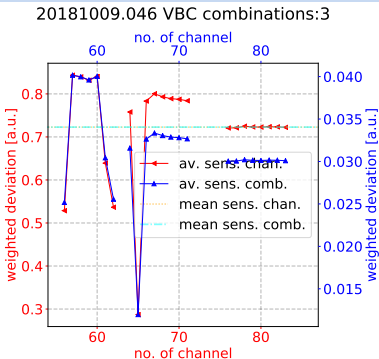
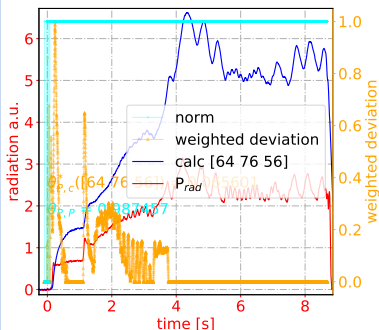
Example and spectrum: feedback 20181009.046 @ KJM



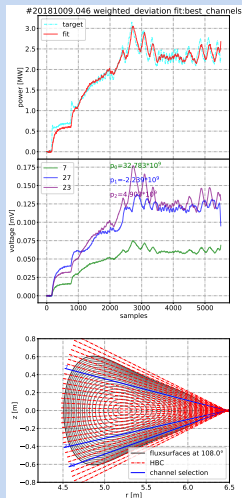
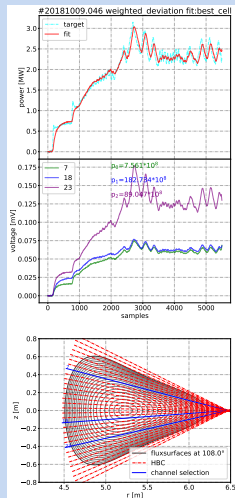
20181009.046 HBC combinations:3



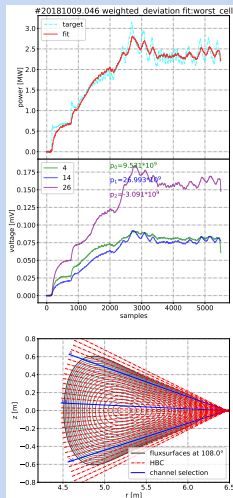
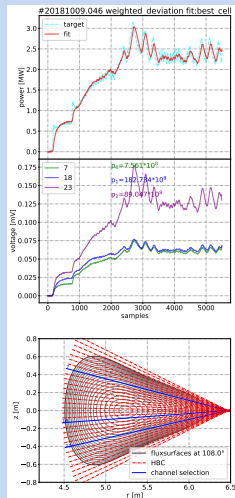
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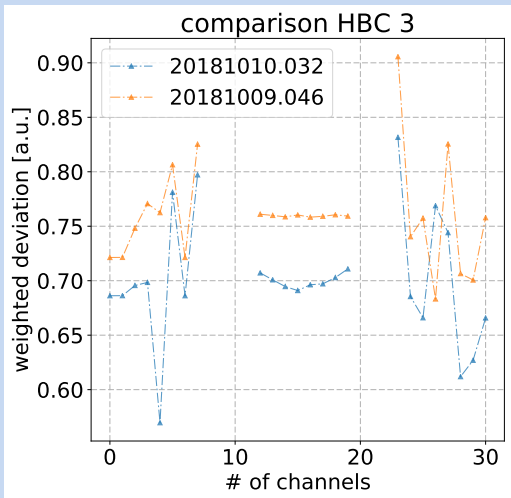
HBC 3 channel combination sensitivity



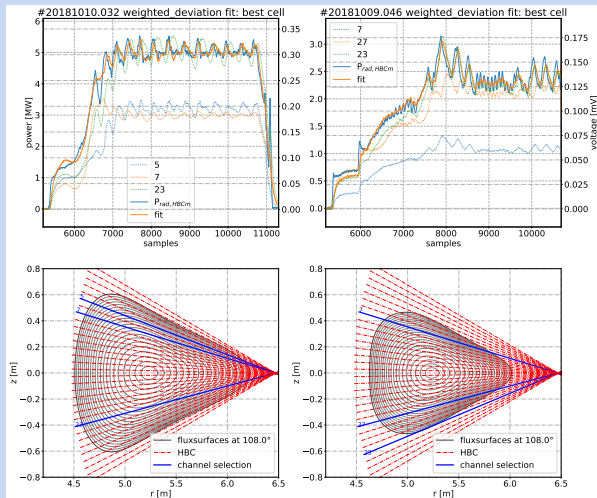
HBC 3 channel combination sensitivity



HBC 3 channel combination sensitivity



HBC 3 channel combination sensitivity



Protocoll

Last protocoll, 2019/05/11:

- 1 calculate sensitivity for channels – localistaion
- 2 check whether this is generally applicable or a function of different system variables
- 3 why is that the case? differences in radiation locals
- 4 applicable conclusions for feedback system

Protocoll

- + check for victoria winters feedback session with different density stages, power leves and CH4
- + just look at O2/O in HEXOS lines to figure stuff out, also C maybe
- + get n_e and T_e profiles regarding the analised XP IDs accordingly from QTB or divertor spectroscopy/MPM

Protocoll

- + IN PARTICULAR:
 - what makes those 'best channels' so important and distinguishes them from others
- + where and what is in magnetic/plasma surface connection (toroidally)
- + P_{rad} not always maximised at LCFS or island necessarily, rather $f(n_e, T_e)$ (moving in/out)

Protocoll

- + at roughly 30% f_{rad} we have 50 eV along the LCFS which results in high oxygen radiation fractions, while the islands slowly start radiating
- + What is the most sensitive and important factor in the spatial radiation profile for the feedback?