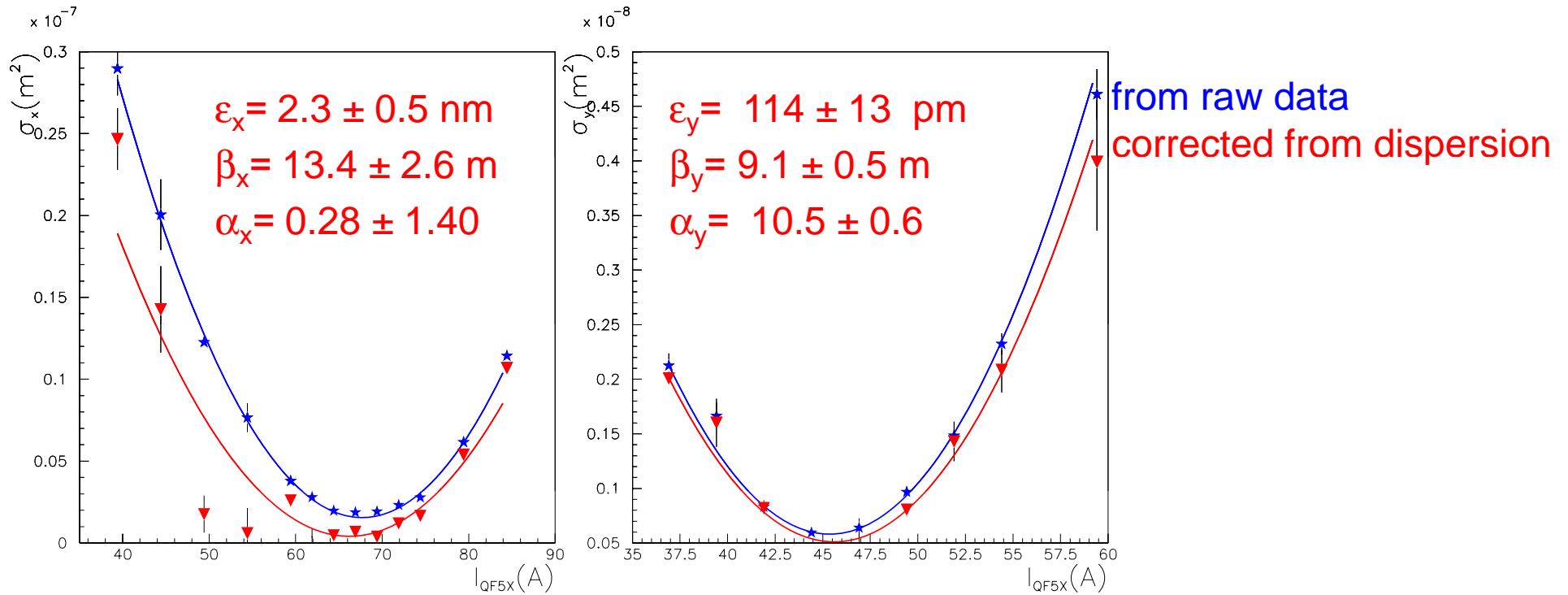


# Updated coupling study-2 from 12 March 08 measurements

# 1-QF5X scan at MW3X



Back propagation to the entrance of Ext line:

$\beta_x = 16.9 \text{ m}$        $\alpha_x = 2.3$

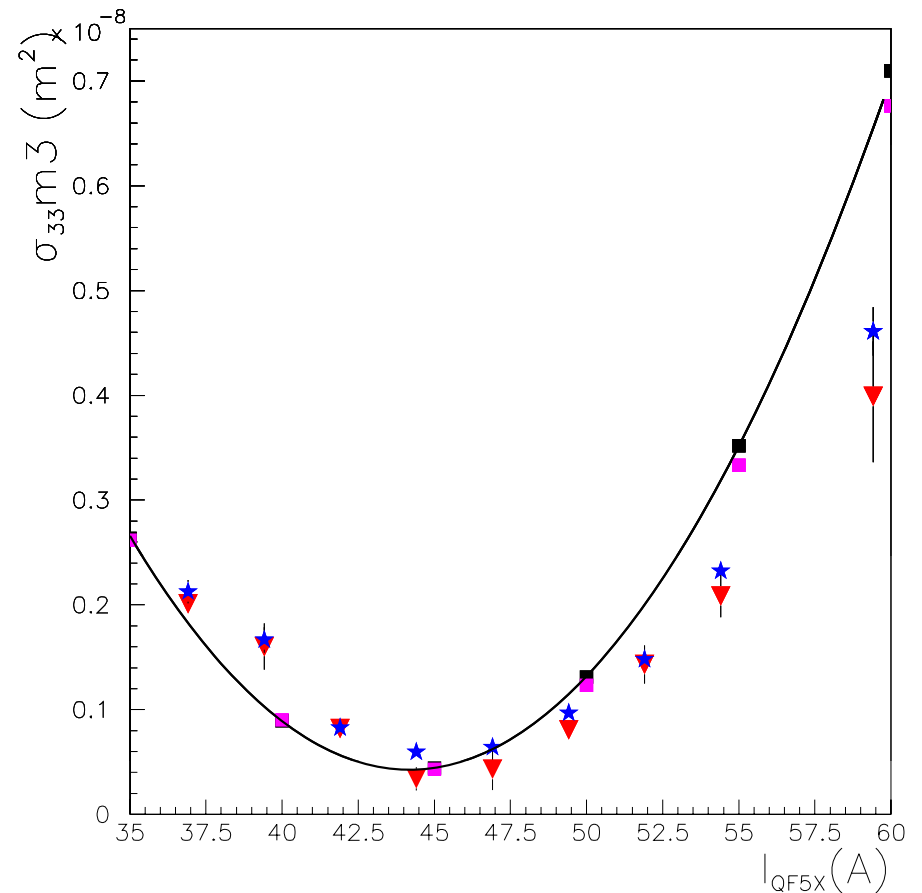
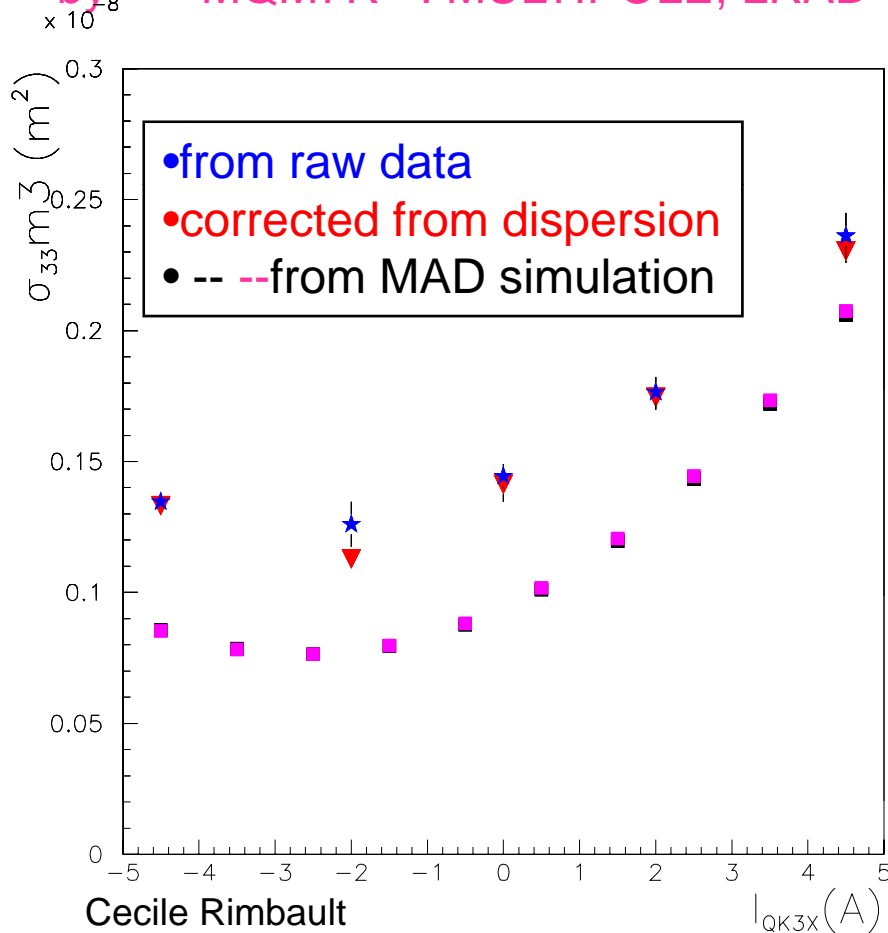
$\beta_y = 0.62 \text{ m}$        $\alpha_y = 1.38$

**Vertical emittance measured in DR: 34pm**

# 2- Coupling modelisation comparison

Measurements are “reproduced” with Skew (Type QK1X) at exit of QM7 set at 3.5A (corresponds to a strength of  $0.0180432\text{m}^{-1}$ ).

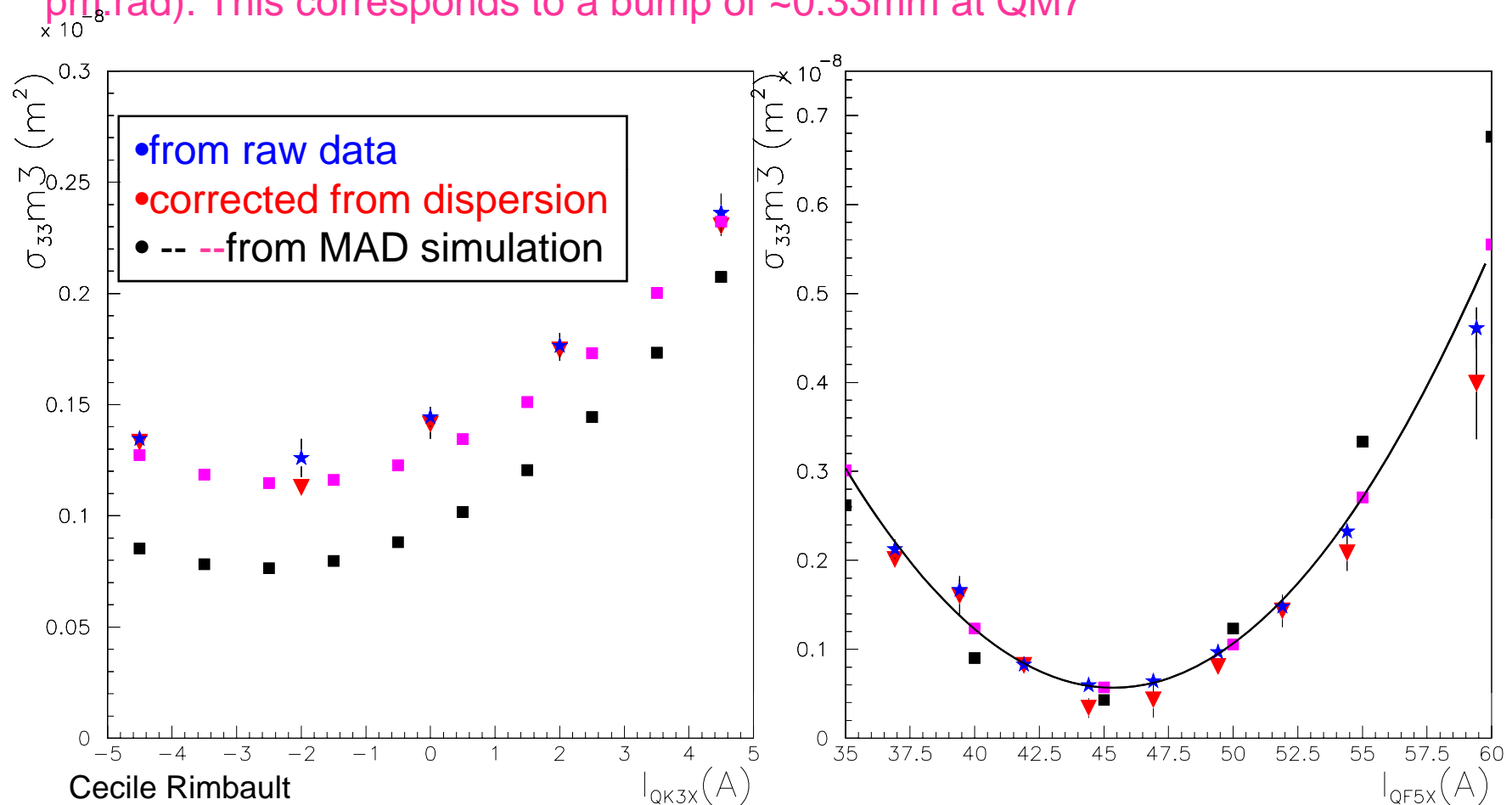
This seems to be equivalent to a multipole set at the middle of QM7 and modeled by MQM7R : MULTIPOLE, LRAD=0.0, K0L=0.0,T0, K1L=0.018,T1



# 3- Search for better fit in modelisation

With Skew set QM7 @3.5A (0.0180432m-1) and measured vertical emittance in DR (34 pm.rad).

With Skew set at QM7 @3A (0.0154656m-1) and vertical emittance X 1.5 (51 pm.rad). This corresponds to a bump of ~0.33mm at QM7

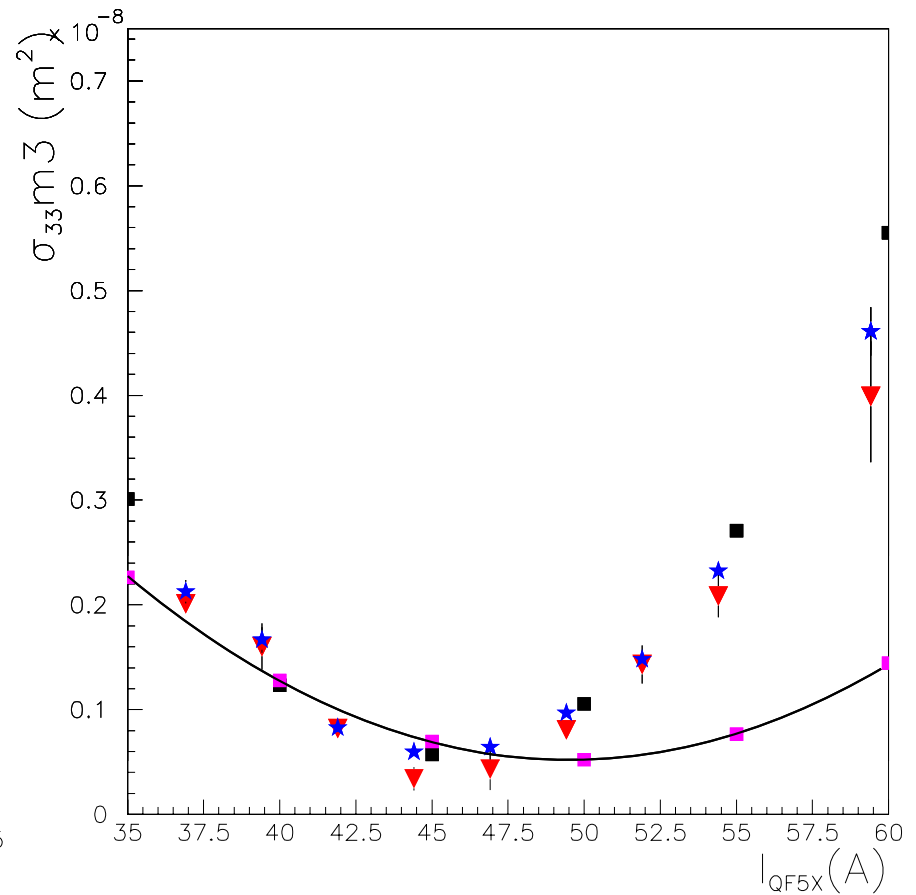
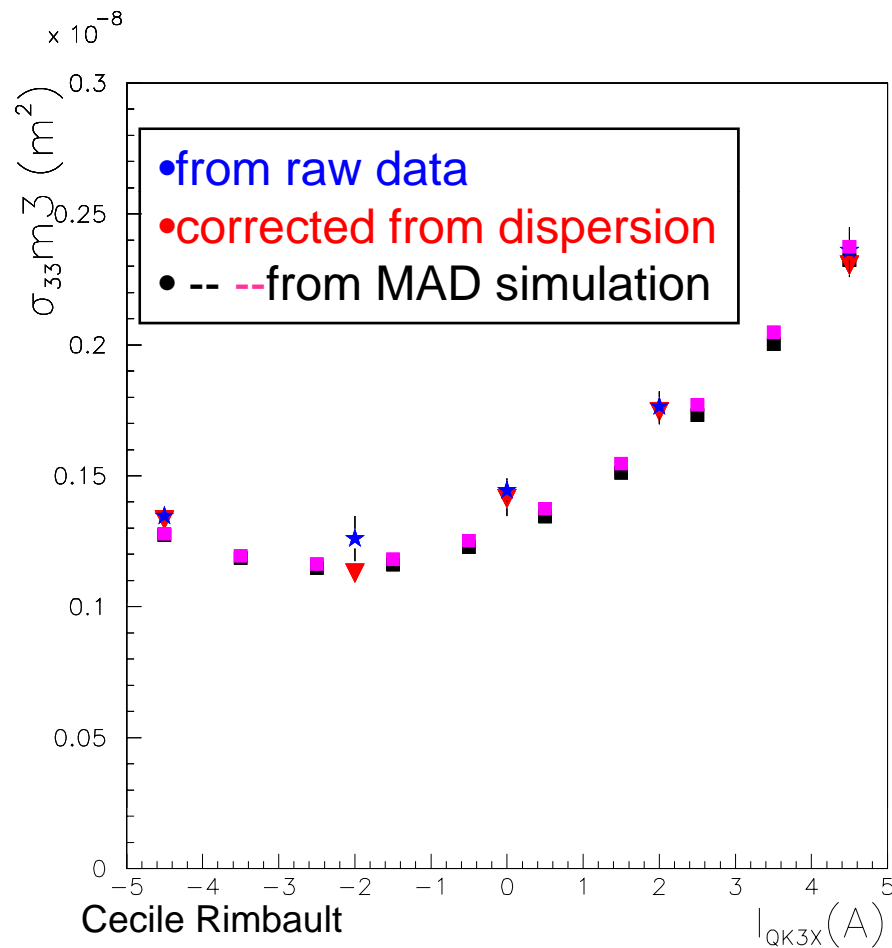


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# 4.1-Search for uniqueness of coupling mimics

With Skew set at QM7 @3A (0.01547m-1) and vertical emittance @51 pm.rad.

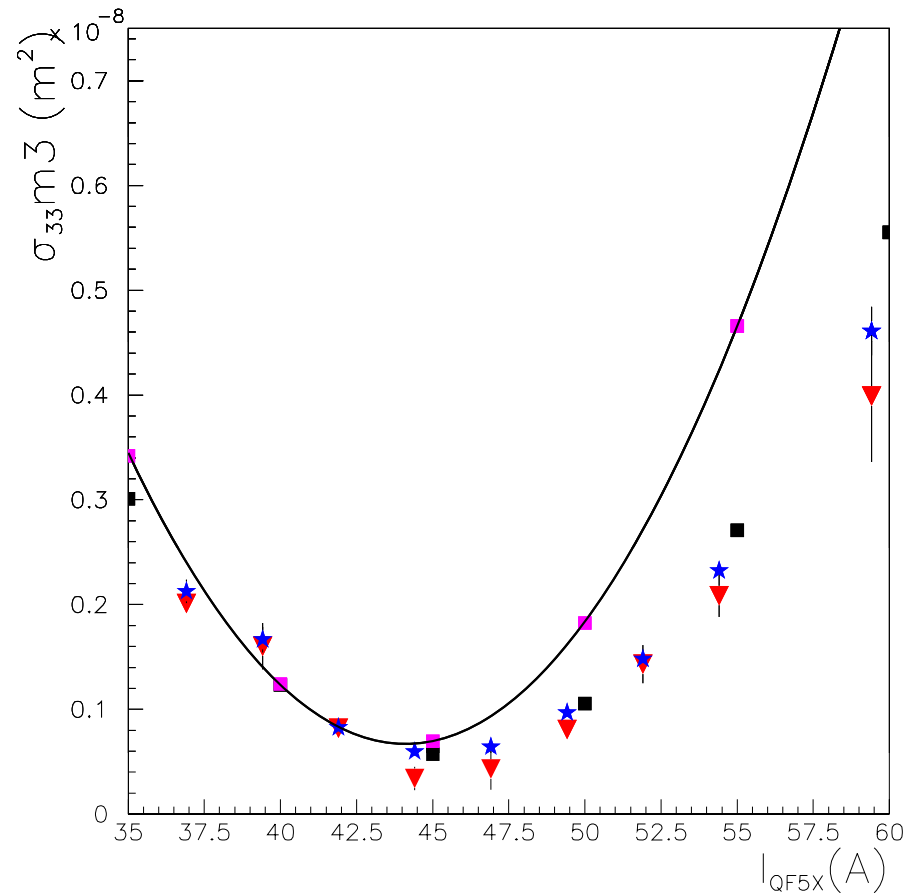
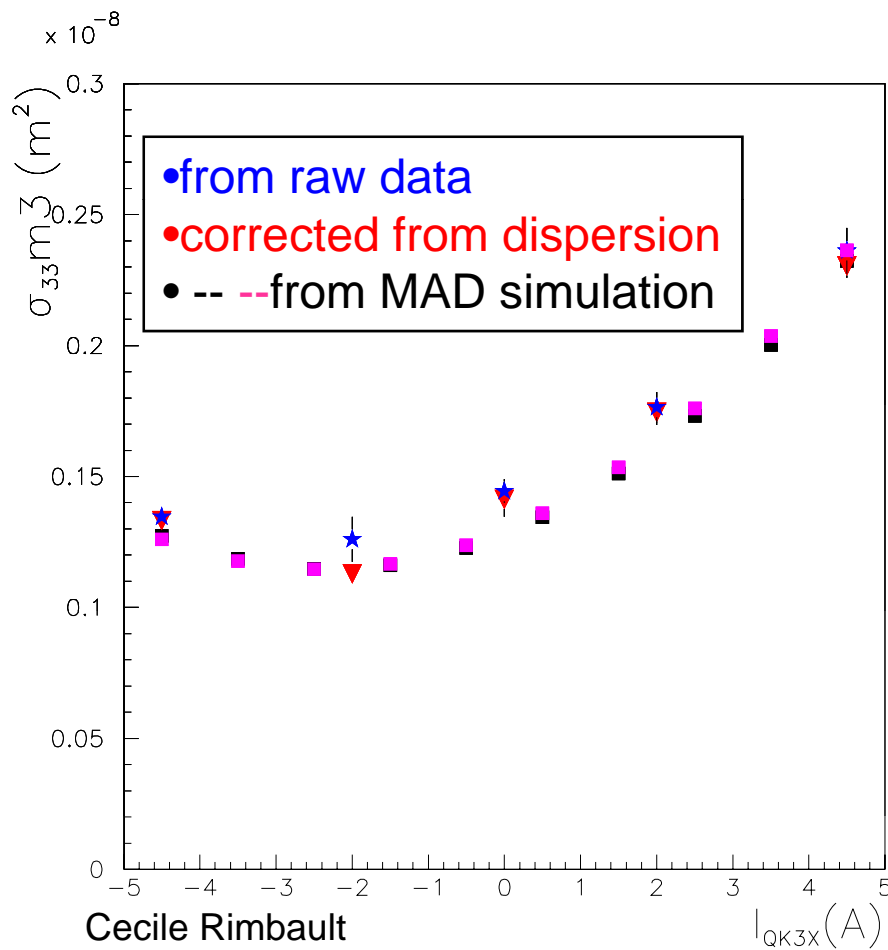
With Skew set at entrance of EXT line @8A (0.04124m-1) and vertical emittance @51 pm.rad.



# 4.2-Search for uniqueness of coupling mimics

With Skew set at QM7 @3A (0.01547m-1) and vertical emittance @51 pm.rad.

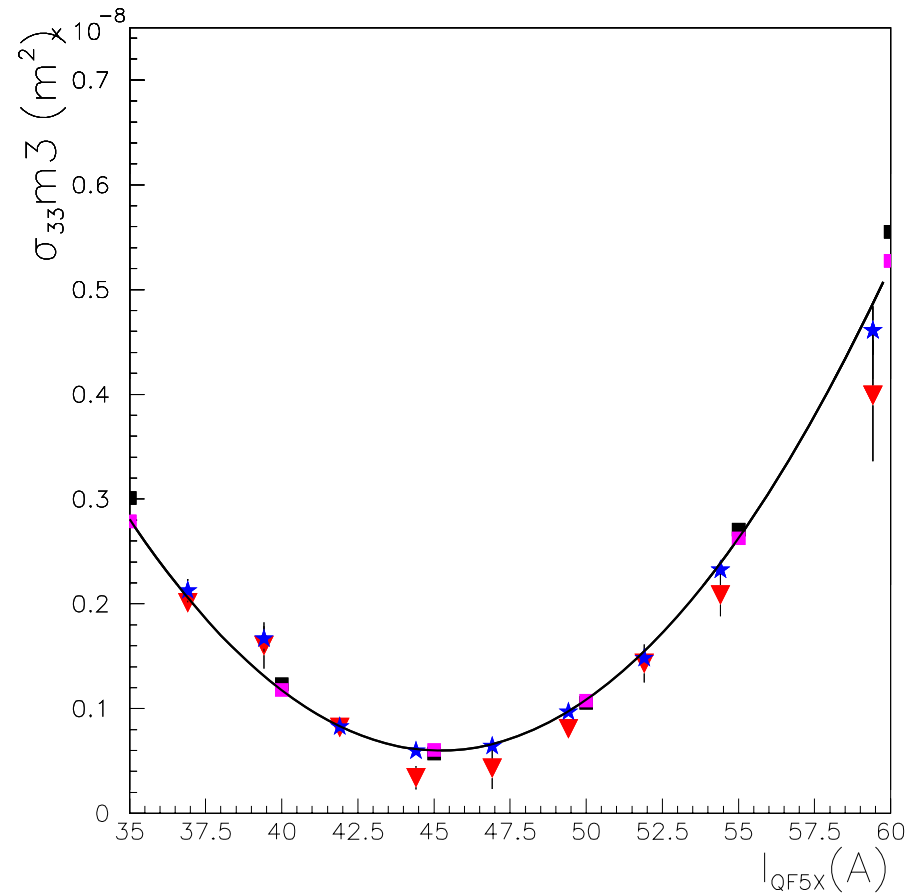
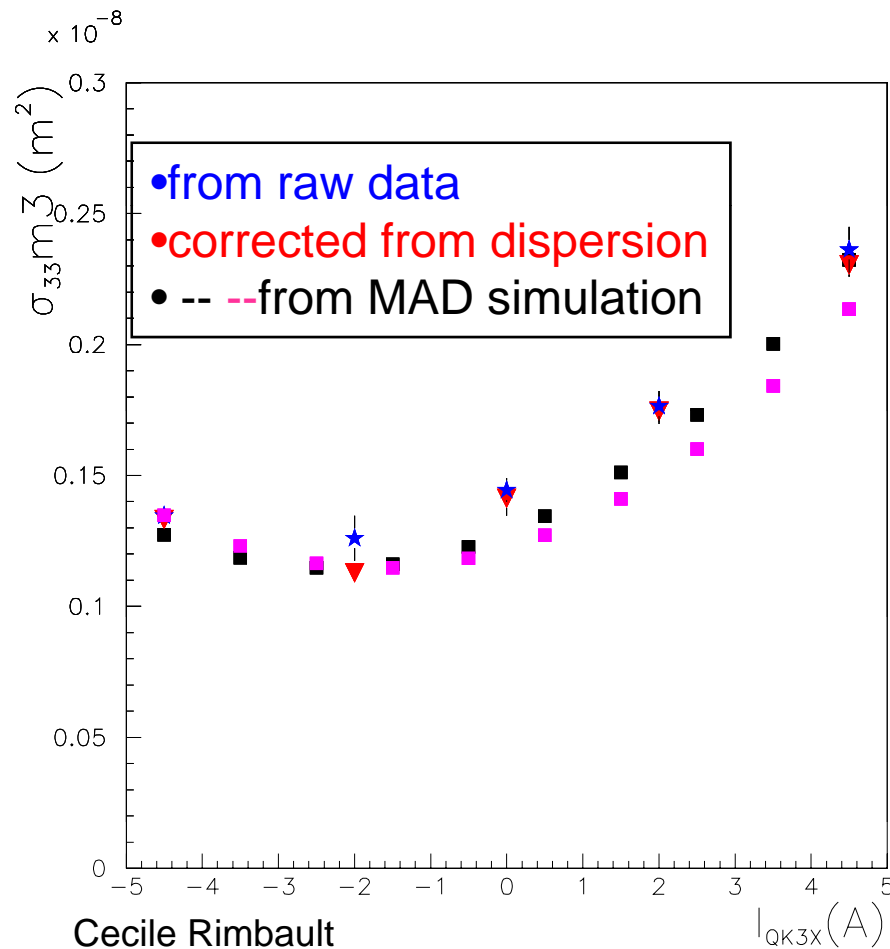
With Skew set at BS1X @3.5A (0.01804m-1) and vertical emittance @51 pm.rad.



# 4.3-Search for uniqueness of coupling mimics

With Skew set at QM7 @3A (0.01547m-1) and vertical emittance @51 pm.rad.

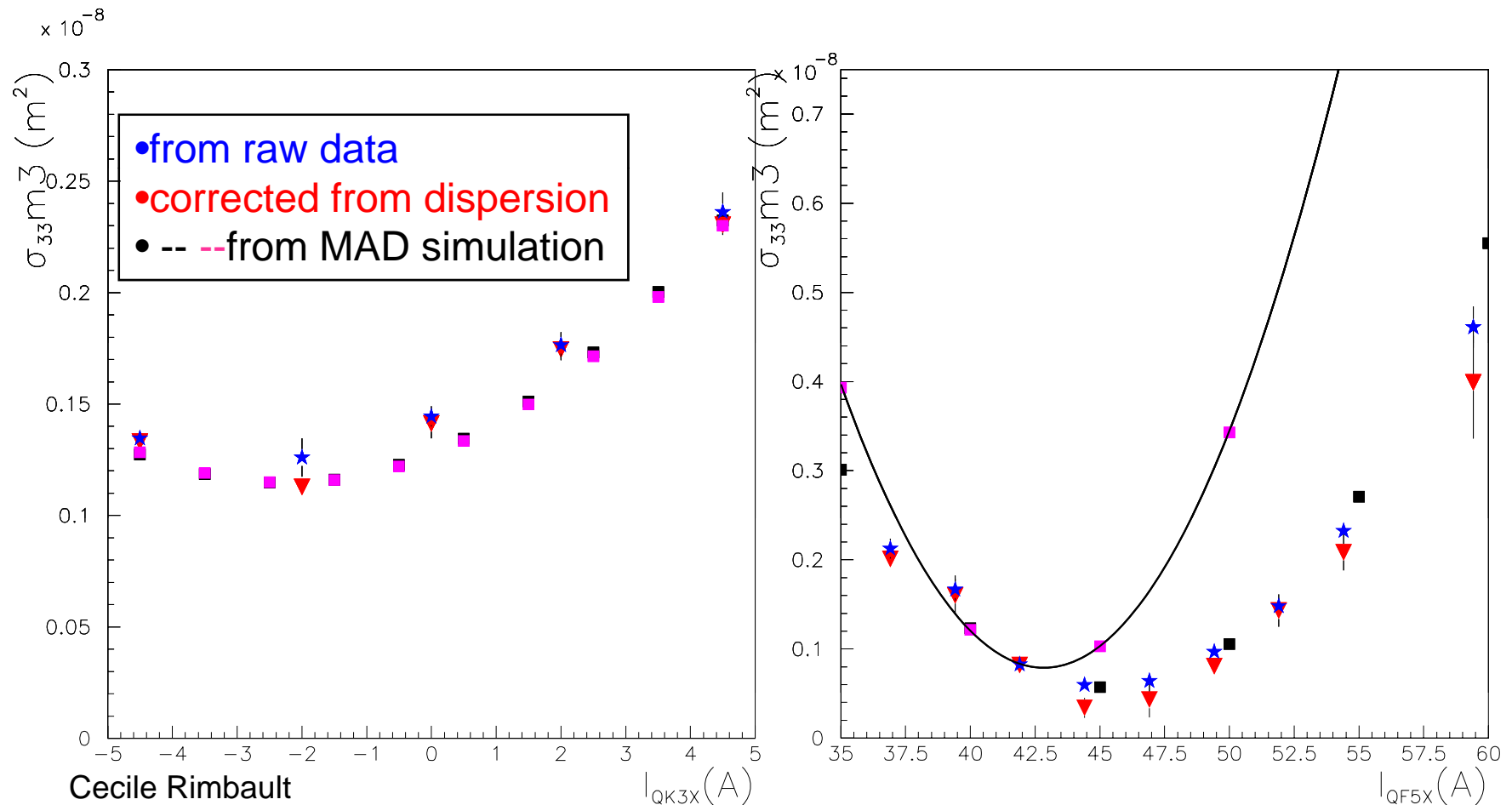
With Skew set at BS1X @2.5A (0.01289m-1) and vertical emittance @51 pm.rad.



# 4.4-Search for uniqueness of coupling mimics

With Skew set at QM7 @3A (0.01547m<sup>-1</sup>) and vertical emittance @51 pm.rad.

With Skew set at BS2X @4A (0.02063m<sup>-1</sup>) and vertical emittance @51 pm.rad.

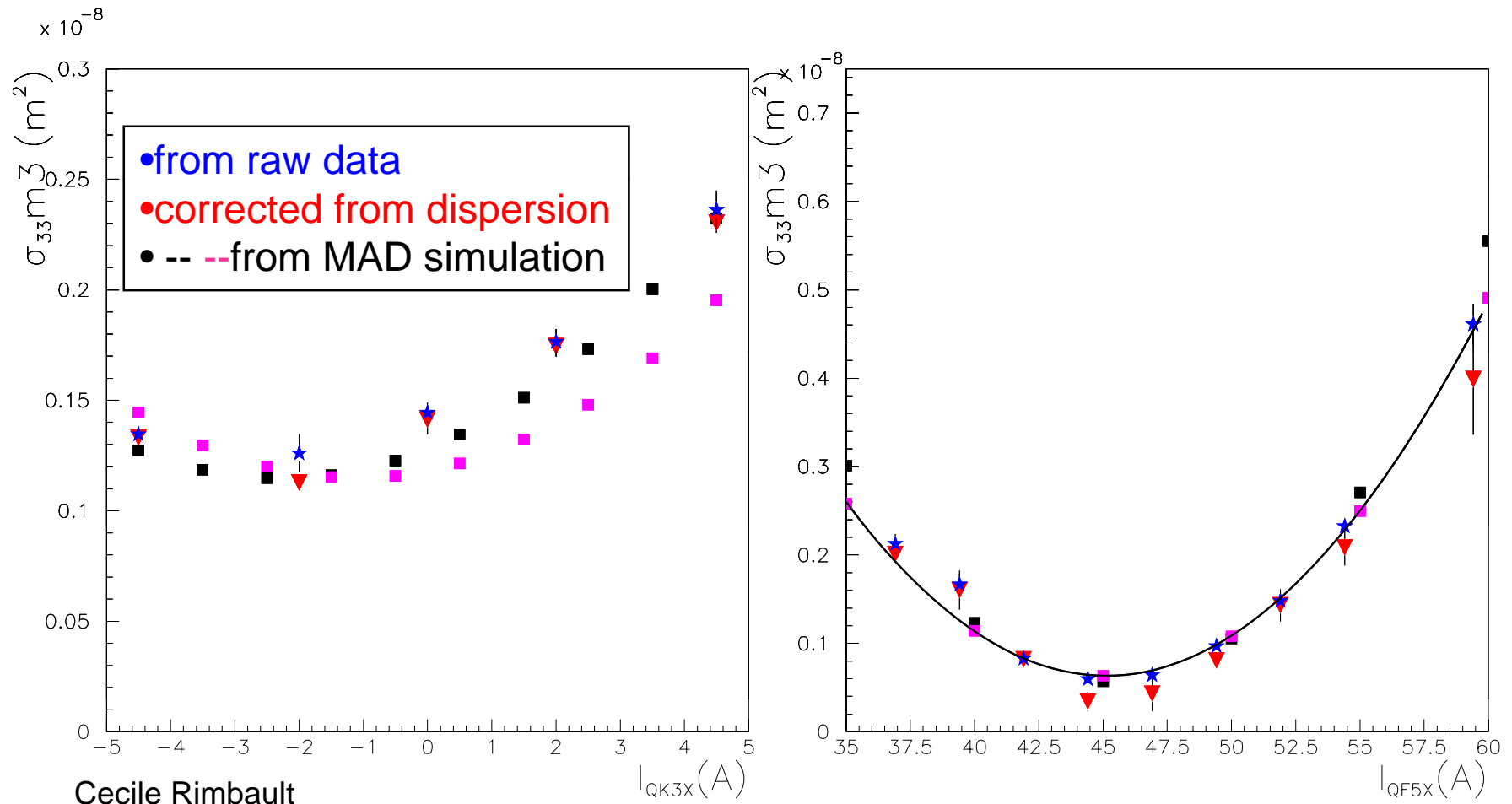




# 4.5-Search for uniqueness of coupling mimics

With Skew set at QM7 @3A (0.01547m-1) and vertical emittance @51 pm.rad.

With Skew set at BS2X @2A (0.01031m-1) and vertical emittance @51 pm.rad.

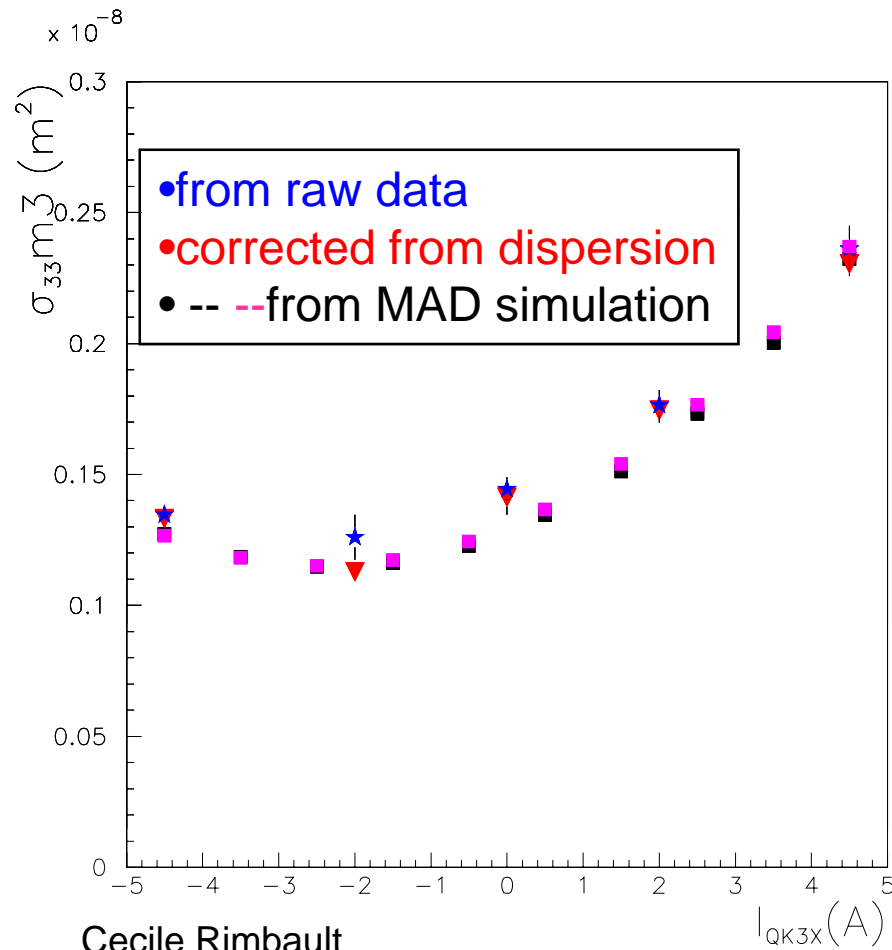


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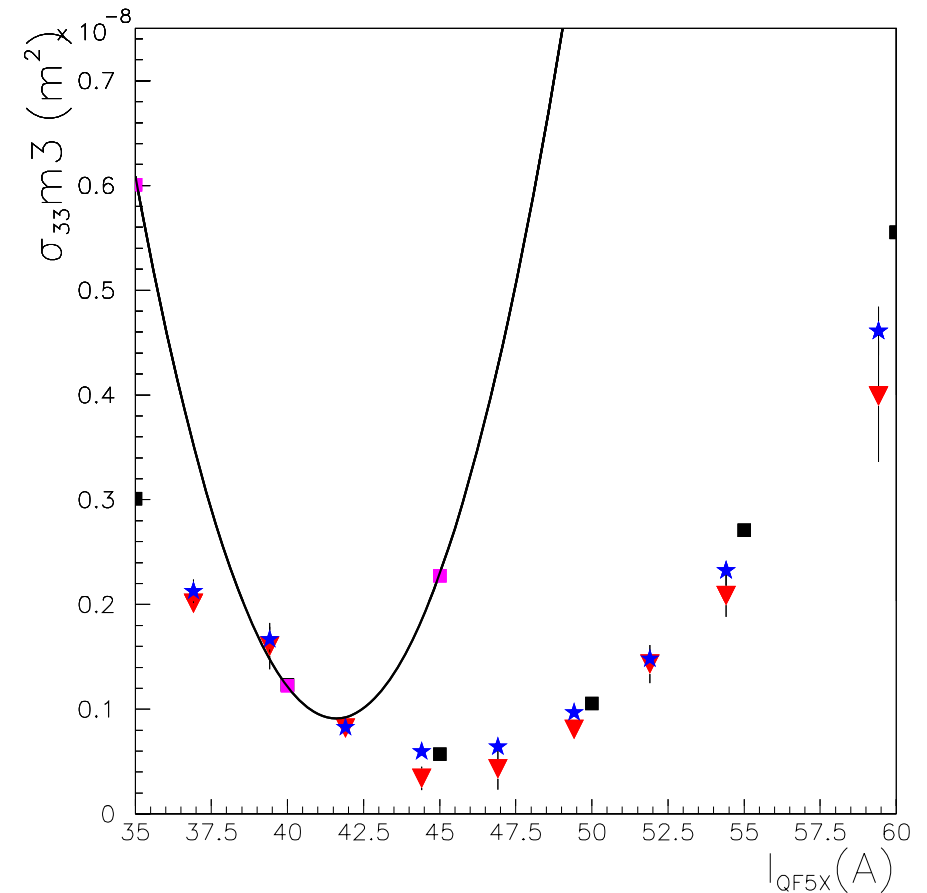
# 4.6-Search for uniqueness of coupling mimics

With Skew set at QM7 @3A (0.01547m-1) and vertical emittance @51 pm.rad.

With Skew set at BS3X @6A (0.03094m-1) and vertical emittance @51 pm.rad.



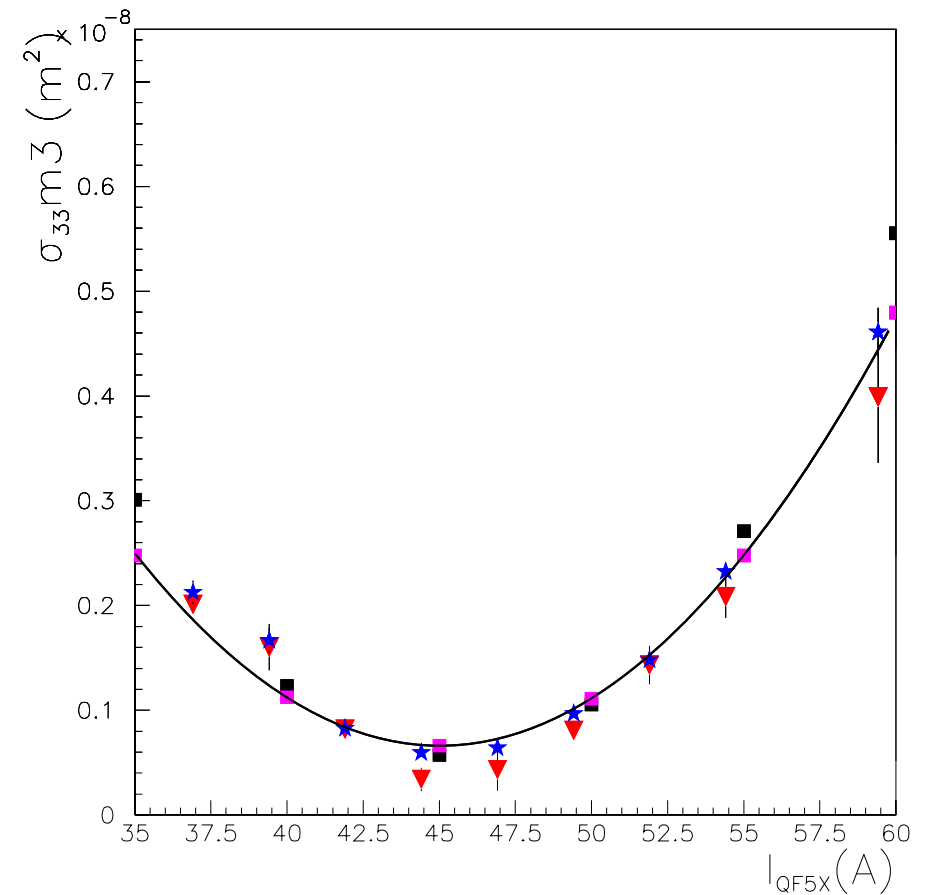
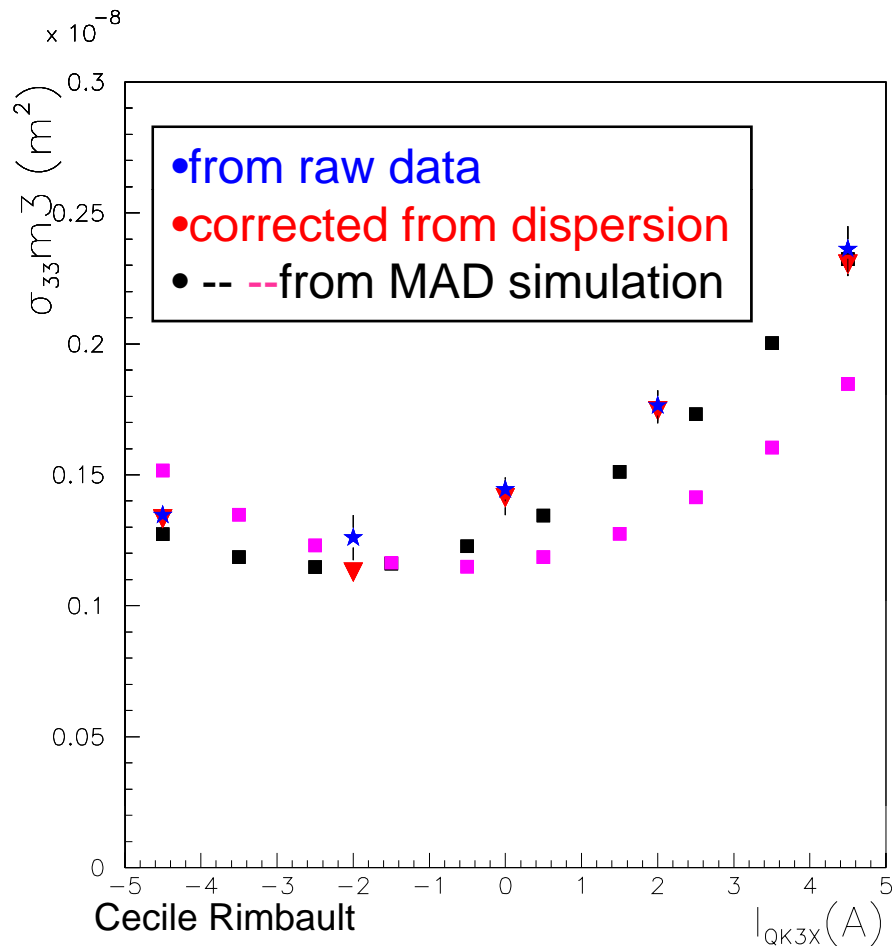
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# 4.7-Search for uniqueness of coupling mimics

With Skew set at QM7 @3A (0.01547m-1) and vertical emittance @51 pm.rad.

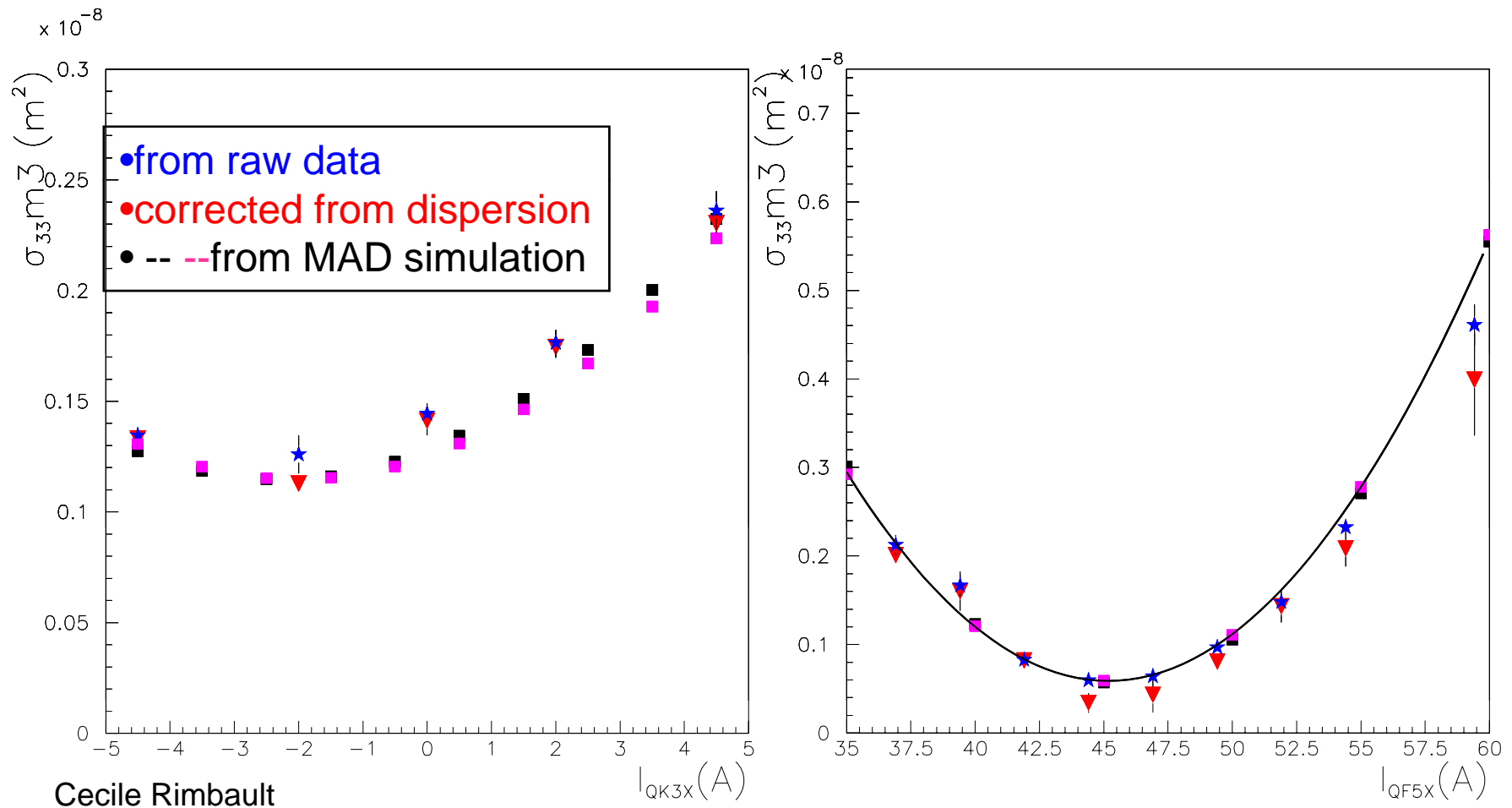
With Skew set at BS3X @1.8A (0.00928m-1) and vertical emittance @51 pm.rad.



# 4.8-Search for uniqueness of coupling mimics

With Skew set at QM7 @3A (0.01547m-1) and vertical emittance @51 pm.rad.

With Skews set at BS1X and QM7 @1.4A (0.00722m-1) and vertical emittance @51 pm.rad. This corresponds for QM7 to a bump of 0.15mm.



# Conclusions

- Simulations indicates that vertical emittance at the entrance of Ext line should be 1.5 larger than what was measured in DR.
- In this case, measurements are well reproduced using skew at QM7.
- QM7 is probably not the only source of coupling. Bending could have a sextupole component (?)