Follow up of field quality issues of MQTL quadrupoles

M. Giovannozzi

- **Tracking results with feed down effects from closed orbit**
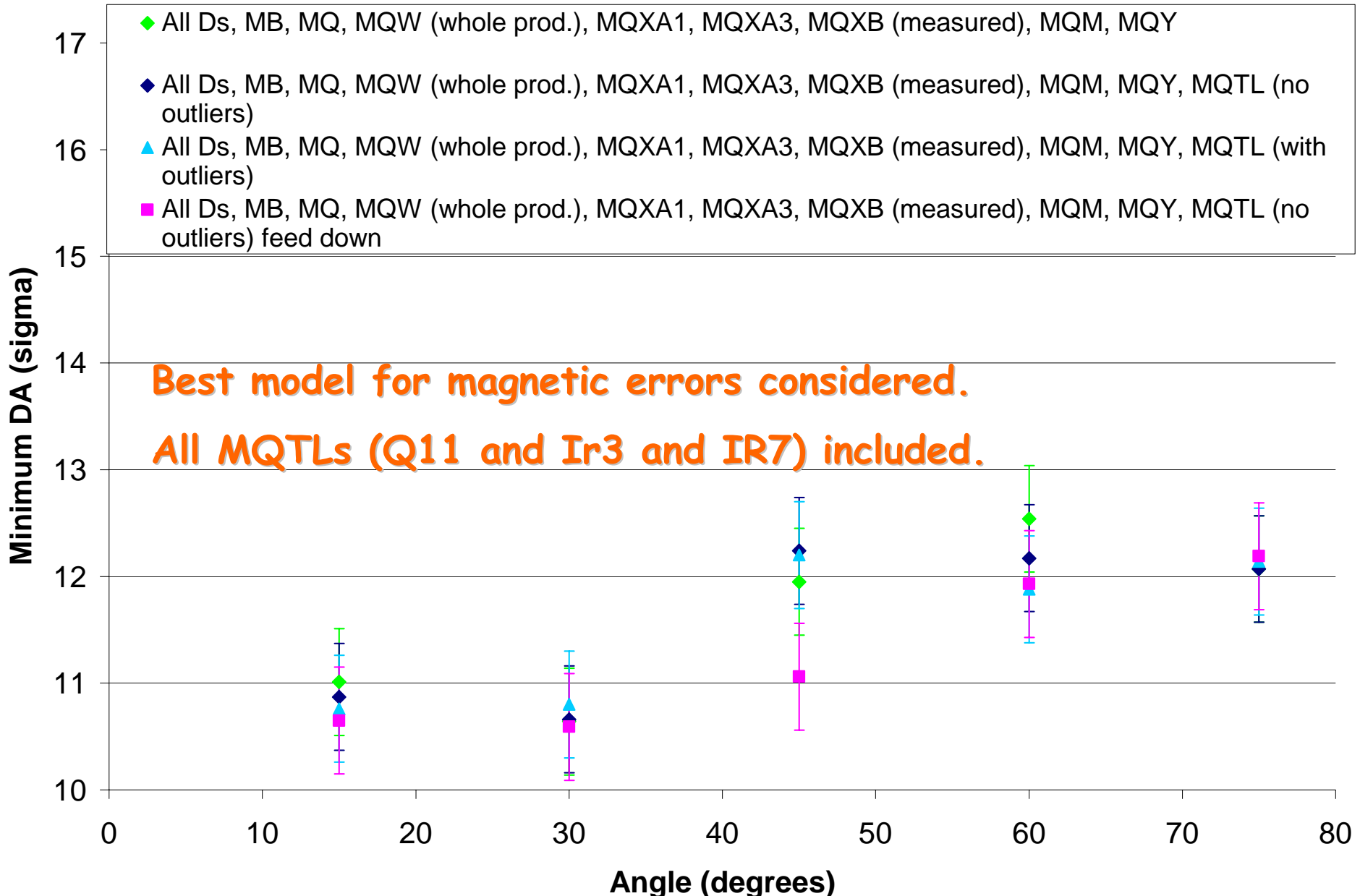
- **Strategy for Q6 in IR3 and IR7**

Acknowledgements: M. Karppinen, R. Wolf

Special thanks: S. Fartoukh -> special version of the errors routines to deal with feed down errors

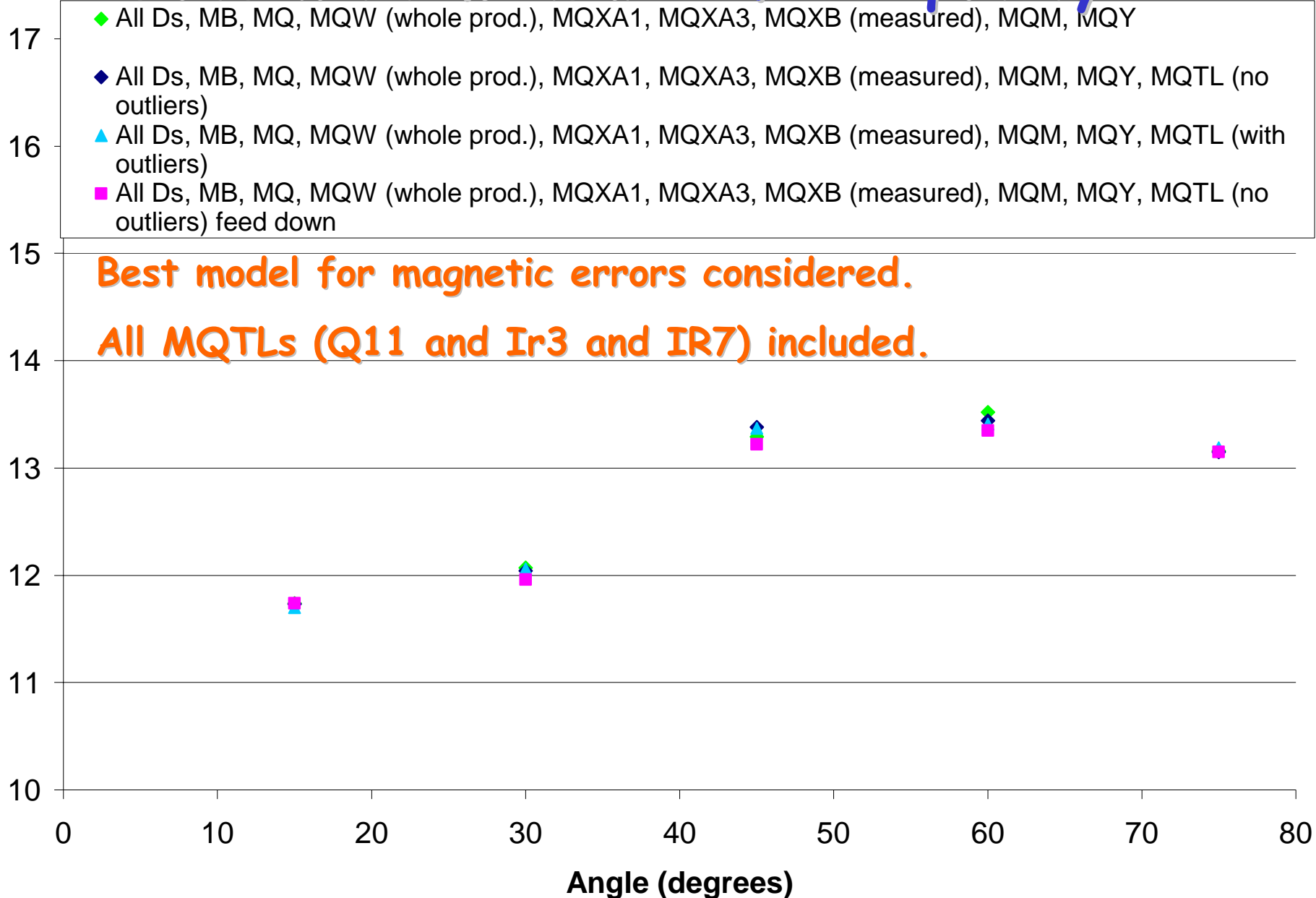# Since last presentation…

- Results of preliminary DA computations indicates that the measured field quality of the MQTLs has a marginal impact.

- The outliers will be considered on a one-by-one basis -> most modules accepted. Three were rejected.

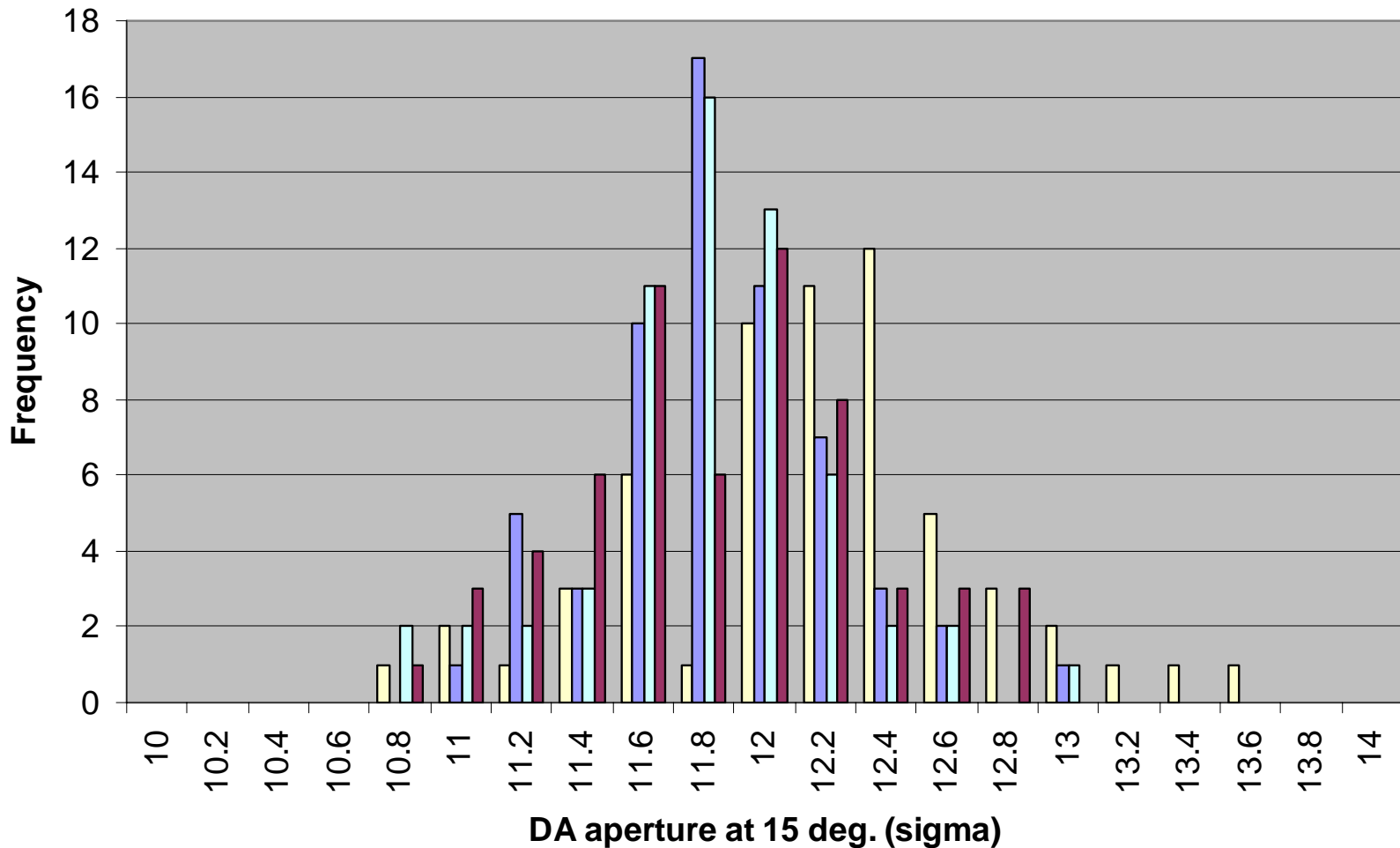- Additional studies are required to assess the impact of closed orbit (feed-down) -> core of this presentation.

Results with measured field quality - I

Legend:
- ◆ (green) All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY
- ◆ (dark blue) All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (no outliers)
- ▲ (cyan) All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (with outliers)
- ■ (magenta) All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (no outliers) feed down

Best model for magnetic errors considered.

All MQTLs (Q11 and Ir3 and IR7) included.

X axis: Angle (degrees)
Y axis: Minimum DA (sigma)

Results with measured field quality - II

Legend:
- (green diamond) All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY
- (dark blue diamond) All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (no outliers)
- (cyan triangle) All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (with outliers)
- (magenta square) All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (no outliers) feed down

Best model for magnetic errors considered.

All MQTLs (Q11 and Ir3 and IR7) included.

X-axis: Angle (degrees)
Y-axis: Average DA (sigma)
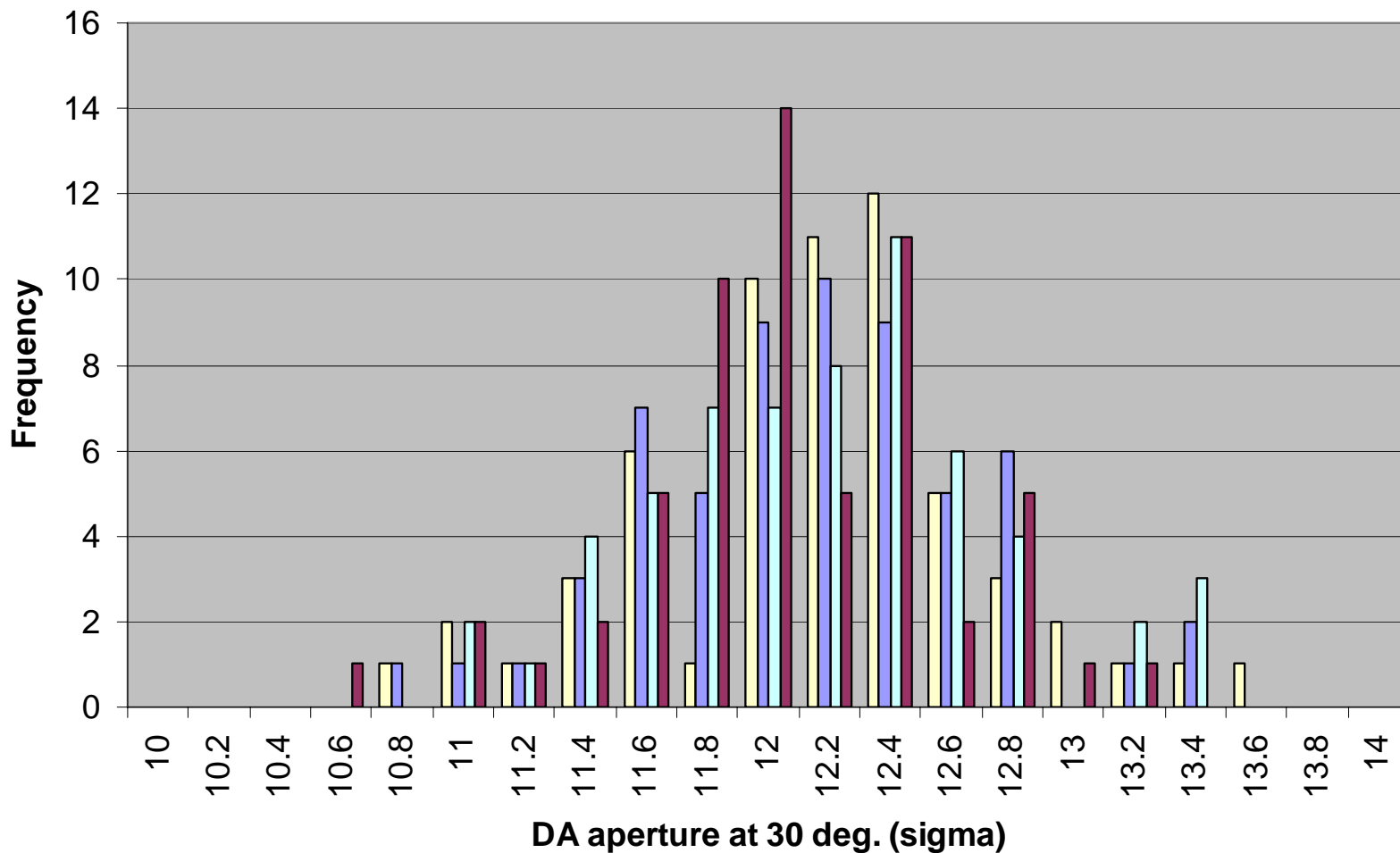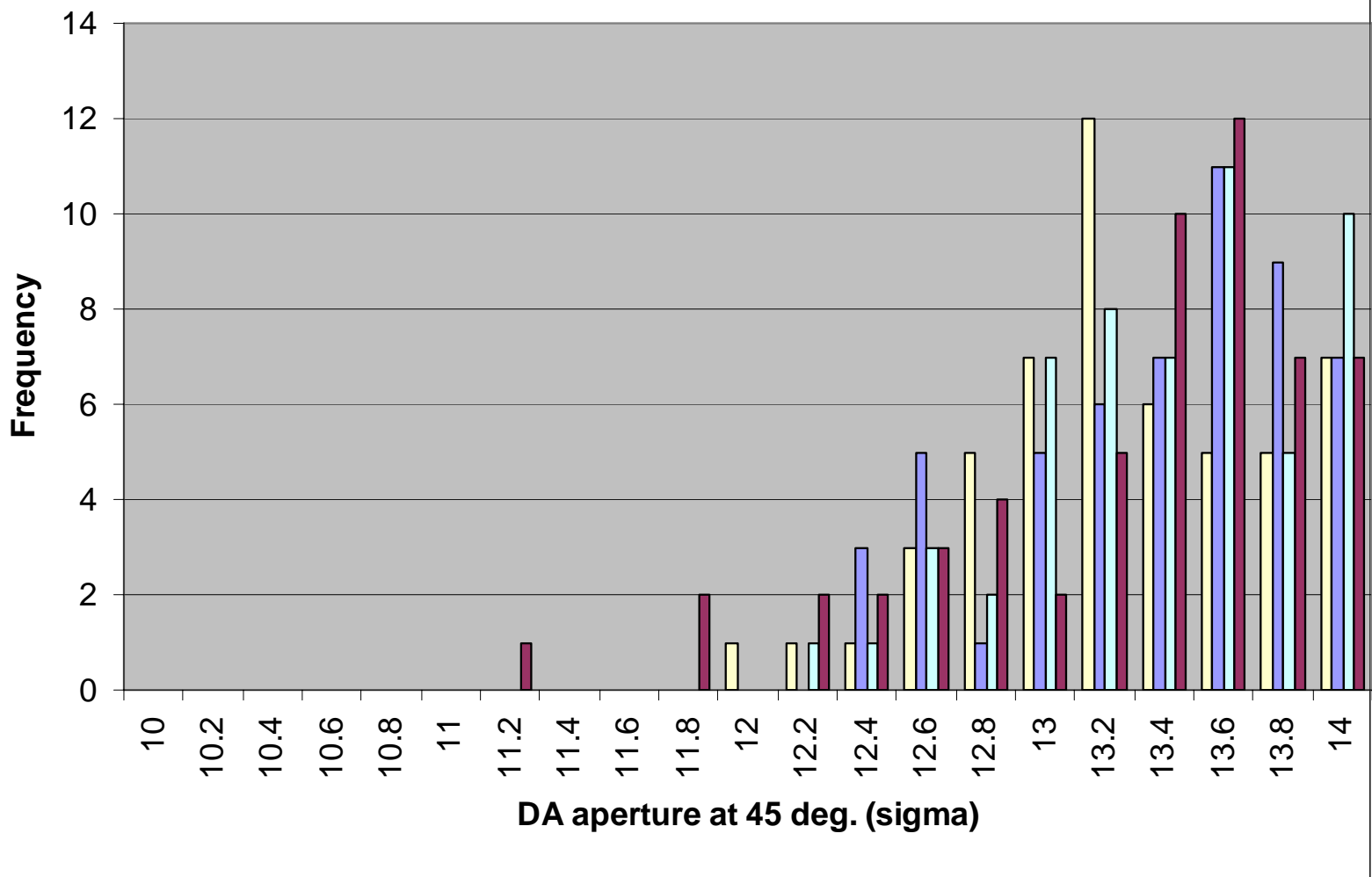
Legend:
- All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY
- All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (no outliers)
- All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (with outliers)
- All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (no outliers) feed down

X-axis: DA aperture at 15 deg. (sigma)
Y-axis: Frequency

- □ All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY
- □ All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (no outliers)
- □ All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (with outliers)
- □ All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (no outliers) feed down

Legend:
- All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY
- All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (no outliers)
- All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (with outliers)
- All Ds, MB, MQ, MQW (whole prod.), MQXA1, MQXA3, MQXB (measured), MQM, MQY, MQTL (no outliers) feed down

X-axis: DA aperture at 45 deg. (sigma)
Y-axis: Frequency

Strategy for Q6 in IR3 and IR7

- **Following discussions with AT-MEL experts:**
  - It is possible to choose the modules used to assembly MQTLH inside Q6.
  - Remark: present "random" choice of modules was particularly bad! Multipoles are summing up coherently.
  - Proposal of modules to build the second Q6 will be given by the end of this week.