# Flux Emergence Rate in Coronal Holes and in Adjacent Quiet-sun Regions

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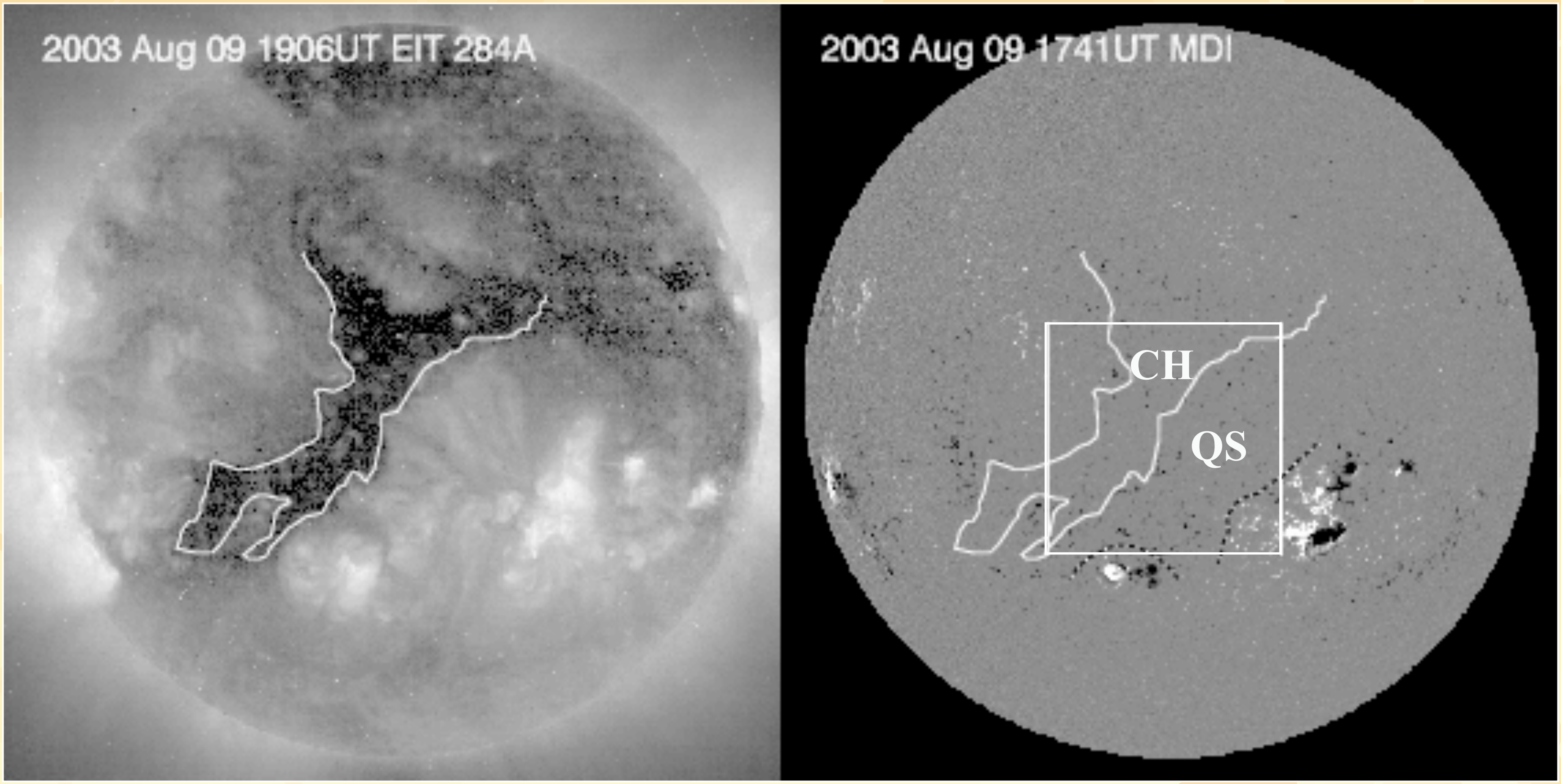
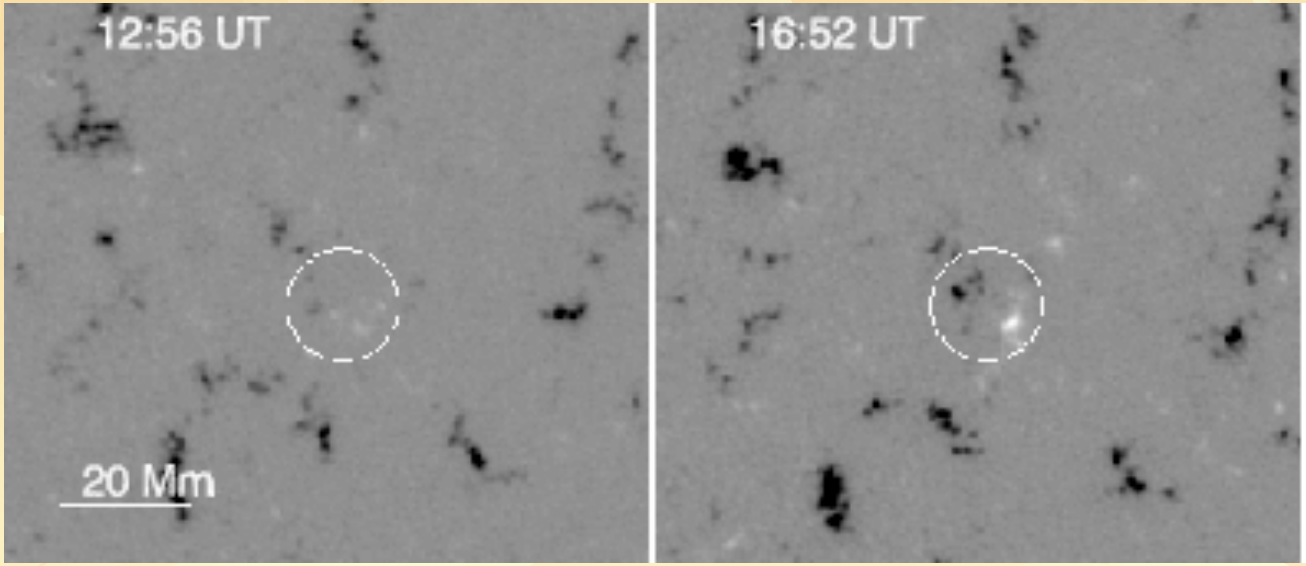



Abramenko, Fisk, Yurchyshyn 2006 (ApJ 641,L65)

# The Rate of Emergence

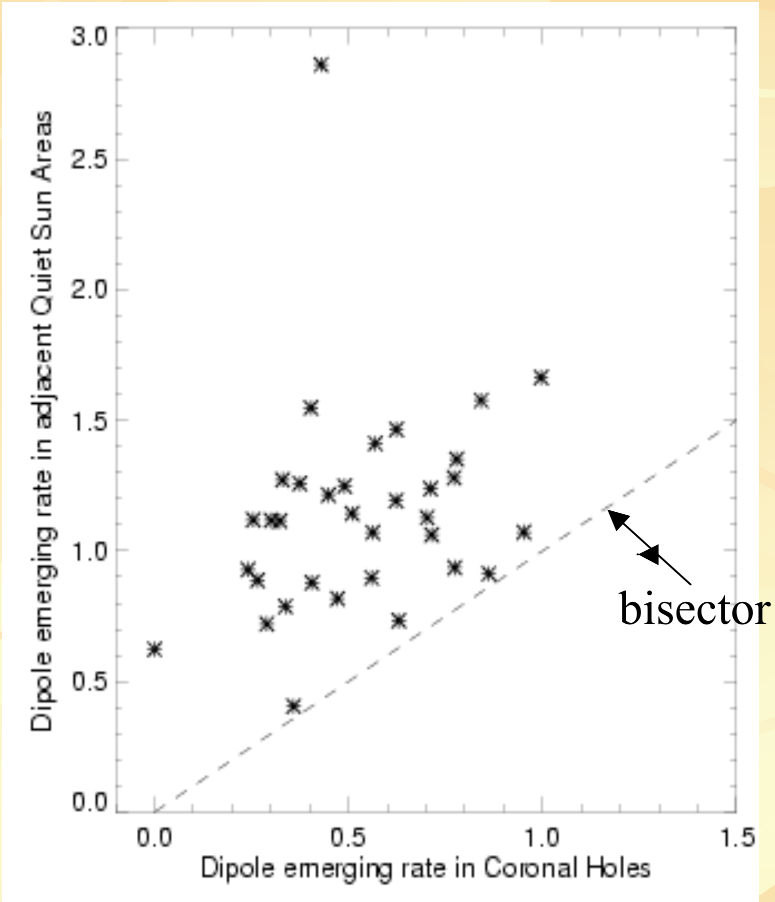



A number of dipoles that emerged during 24 hours inside an area of 200 x 200 Mm is taken as the Dipole Emergence Rate:

$$m = \frac{\text{Number of dipoles}}{\text{Area} \cdot \text{Time Interval}}$$

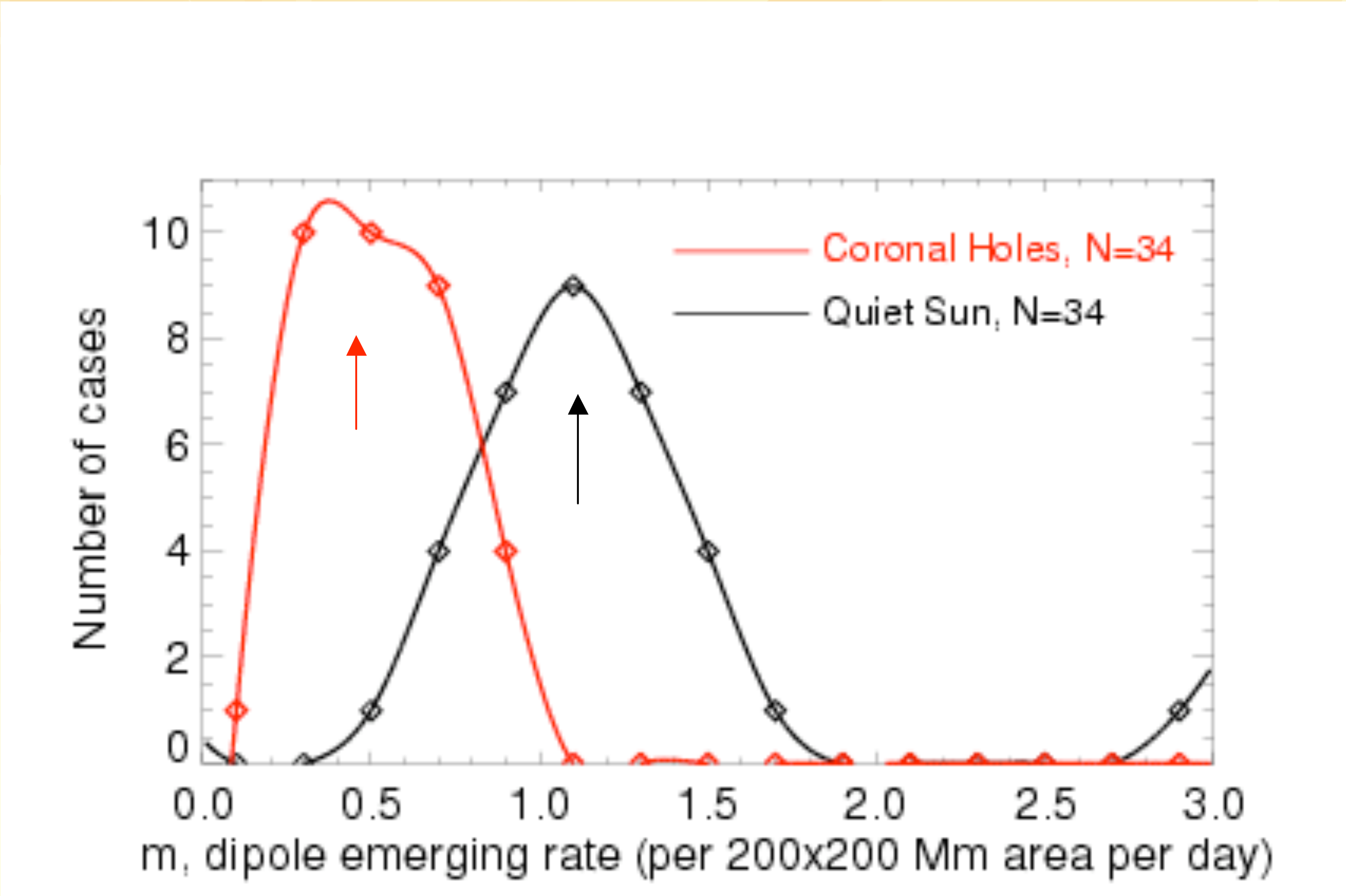
# m(CH) versus m(QS)

m(QS)




m(CH)

# Distribution of the Rate of Emergence



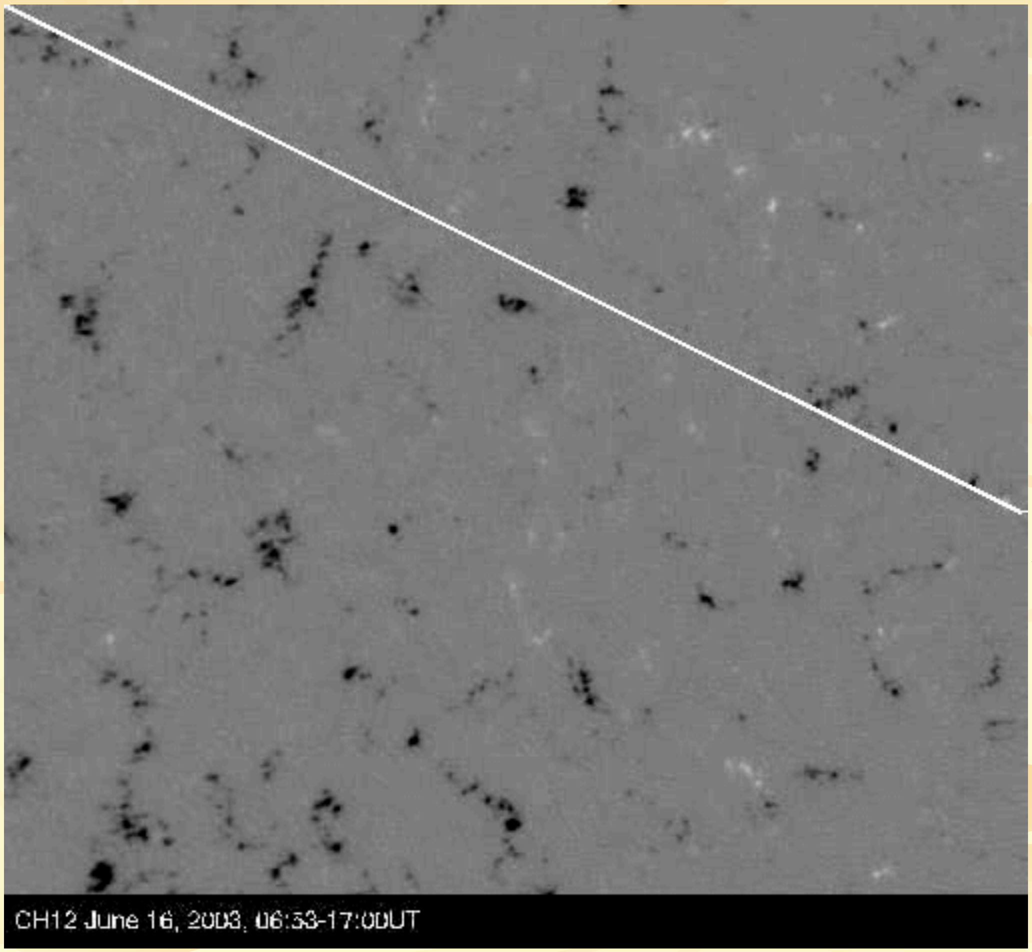
# High Cadence Data

Low cadence:

$$\frac{m(QS)}{m(CH)} = 4.4$$

High cadence:

$$\frac{m(QS)}{m(CH)} = 3.6$$



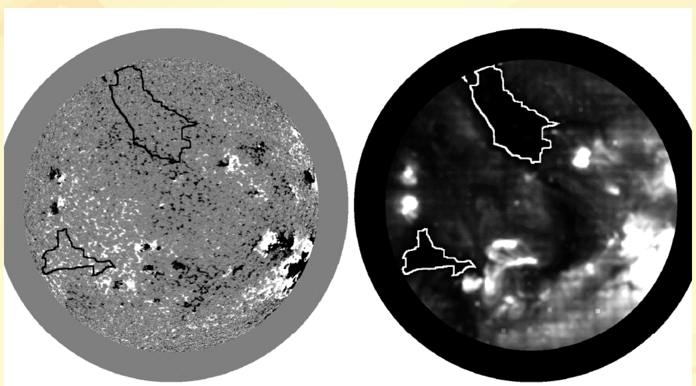

QS

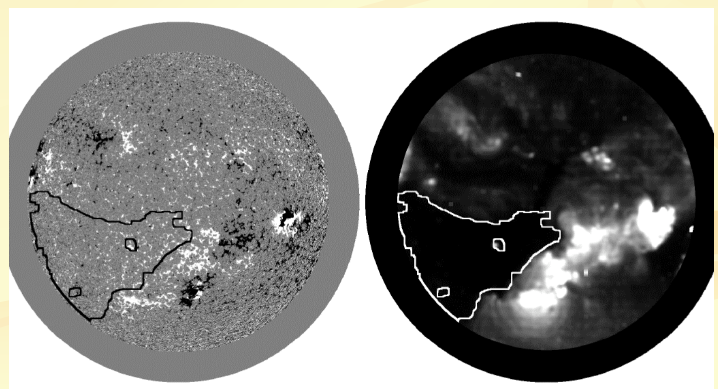
CH

HSD: Hagenaar, Schrijver, DeRosa study
AFY: Abramenko, Fisk, Yurchyshyn study

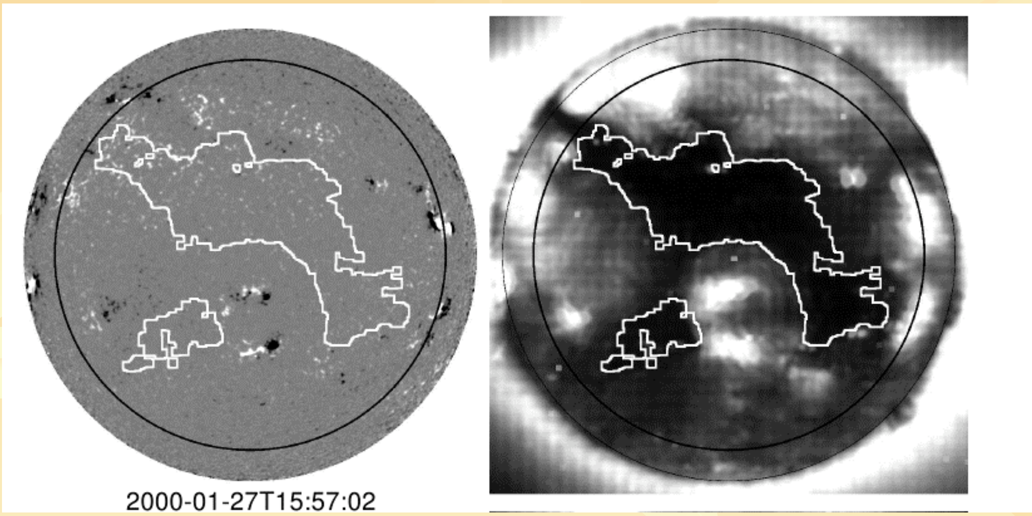
# HSD versus AFY

| CH 2002/07/31 | | cadence | CH 2003/05/30 | | cadence |
|---|---|---|---|---|---|
| AFY: | N(qs)/N(ch)= 1.73 | 3-5 h | AFY: | N(qs)/N(ch)= 1.19 | 3-5 h |
| HSD-V1: | N(qs)/N(ch)= 1.48 | 5 min | HSD-V1: | N(qs)/N(ch)= 1.22 | 5 min |
| HSD-V2: | N(qs)/N(ch) = 2.4 | 5.min | HSD-V2: | N(qs)/N(ch)= 1.8 | 5 min |
| HSD-V3: | N(qs)/N(ch) = 2.6 | 5 min | HSD-V2: | N(qs)/N(ch)= 1.6 | 5 min |

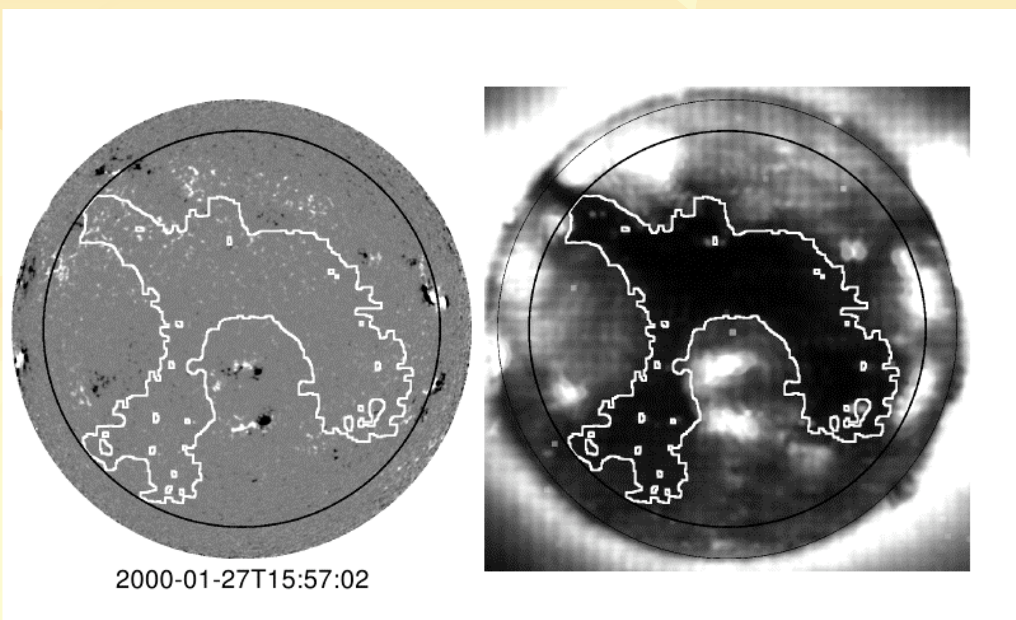




Broadening of the CH boundary results in lowering of the ratio N(qs)/N(ch):




HSD-V3: N(qs)/N(ch)= 2.9




HSD-V4: N(qs)/N(ch)= 0.82

# Conclusions

**The dipole emergence rate in Quiet-Sun areas exceeds approximately twice that in Coronal Holes.**

**The dipole emergence rate depends on the resolution and time cadence.**

**This implies that a coronal hole is a region with a local minimum in the rate of dipole emergence.**