CS1 Data Analysis - stability

10th January, 2007

Inspected by:

Pandey, Gianni, Ger deBruyn

Outline

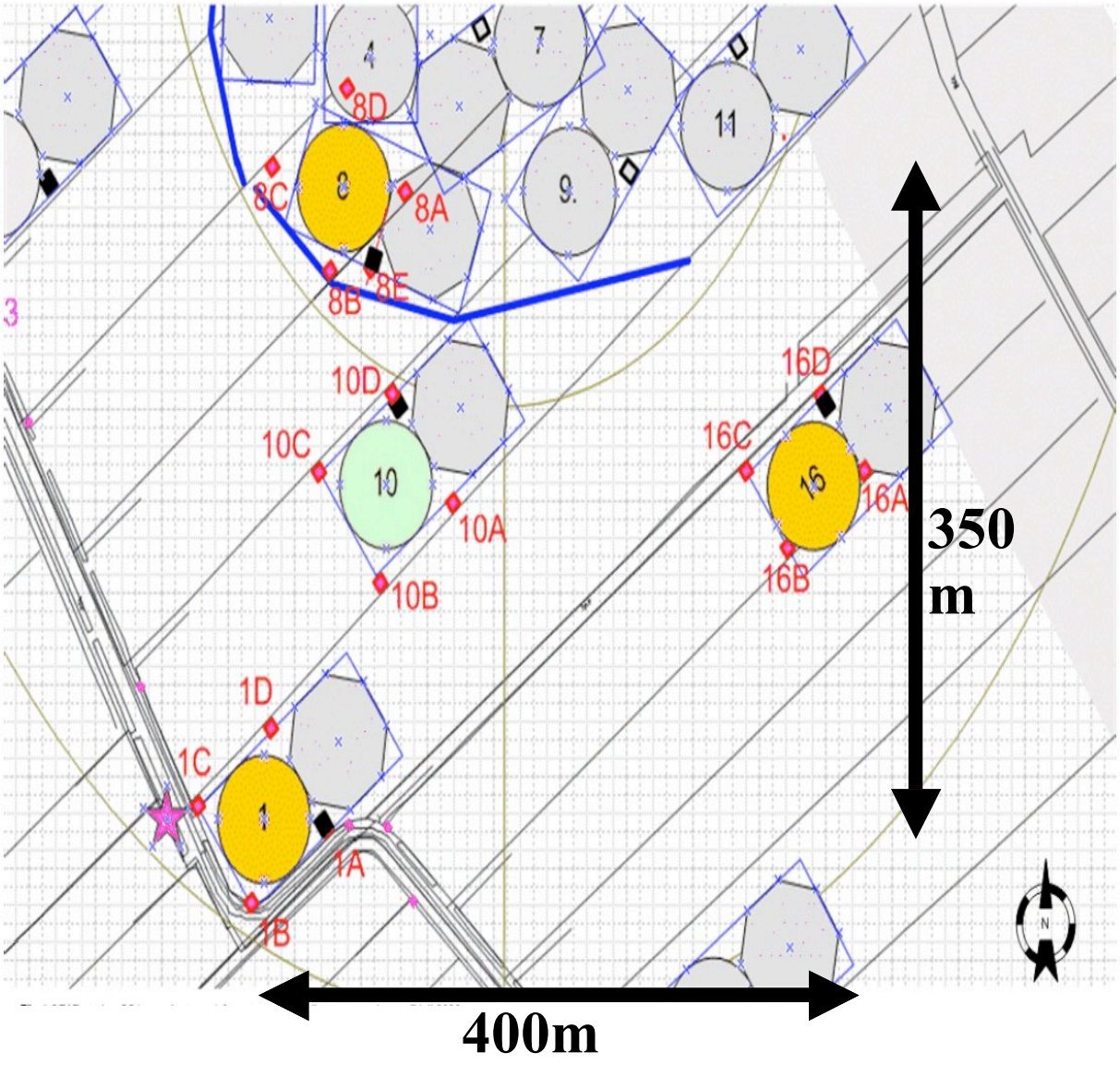
- **MSets Observed/Inspected**
- **Auto Correlations**
- **General comments**
- **Stability Issues**
- **More to do/Conclusions**

CS1 - Configuration

- **96 dipoles**
- **24 Micro stations**
- **4 Stations 1,8,10,16**
- **Presently Obsvn:**

16 Microstns

- ***Stn 1 – 4 microstns***
- ***Stn 8 – 4 microstns***
- ***Stn 10 – 4 microstns***
- ***Stn 16 – 4 microstns***



Measurements Sets Inspected

L2006_0583.MS to L2007_00712.MS
(Dec 15, 2006) to (Jan 7, 2007)

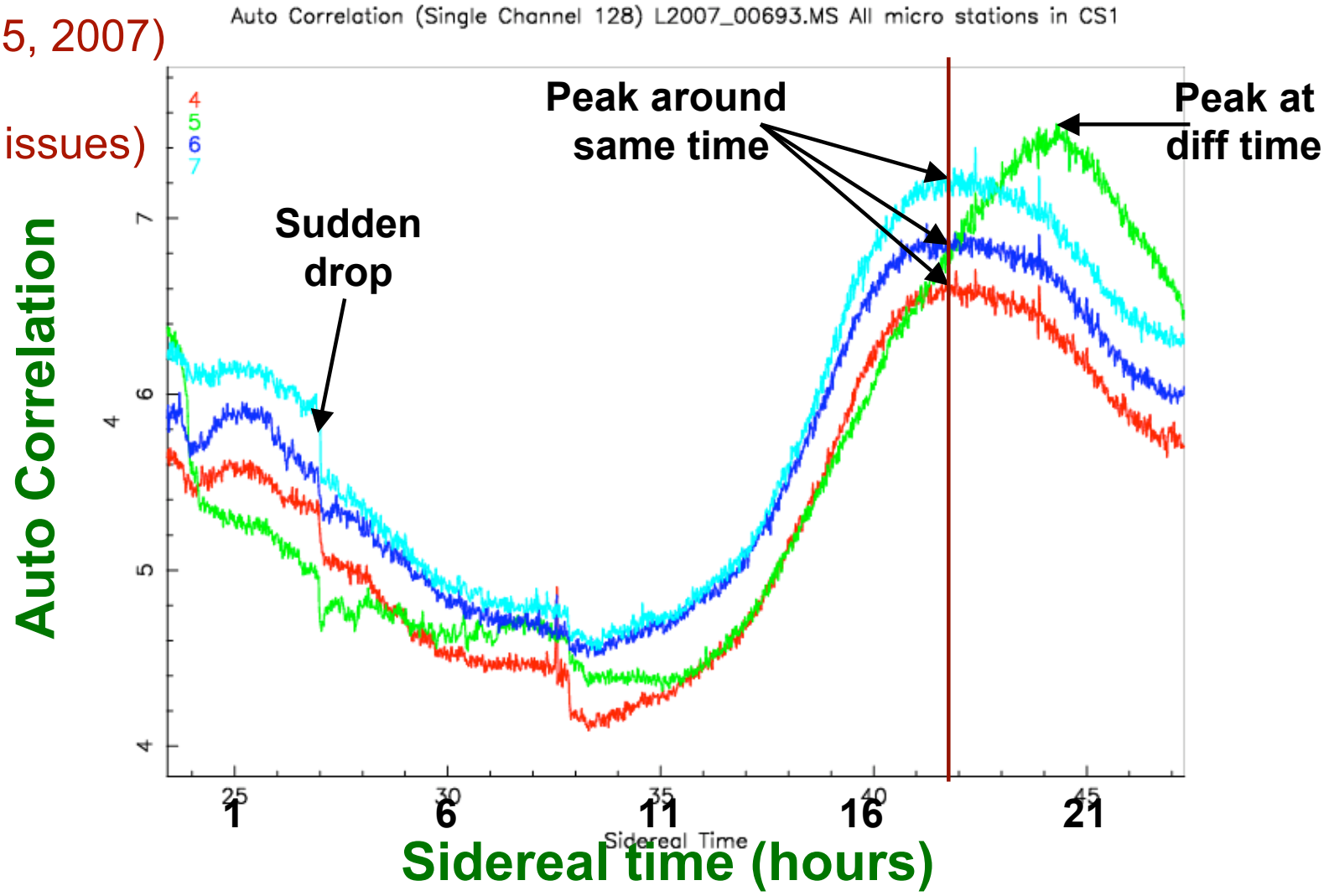
- 16 micro stations in total(4 micro stations each STN 1, 8, 10, 16).
- 1 dipole on in each micro station
- Frequency 60MHz
- Sub band 156.25 Khz, 256 channels => 0.6 Khz resolution
- Various issues like time stamping problems & fringe stopping (analysis/conclusions not so useful).

- Analysis from L2007_00693.MS, L2007_00698.MS, L2007_00712.MS (Time stamping fine, Header is also fine).
- Analysis -> aims to check if basic things are working fine.

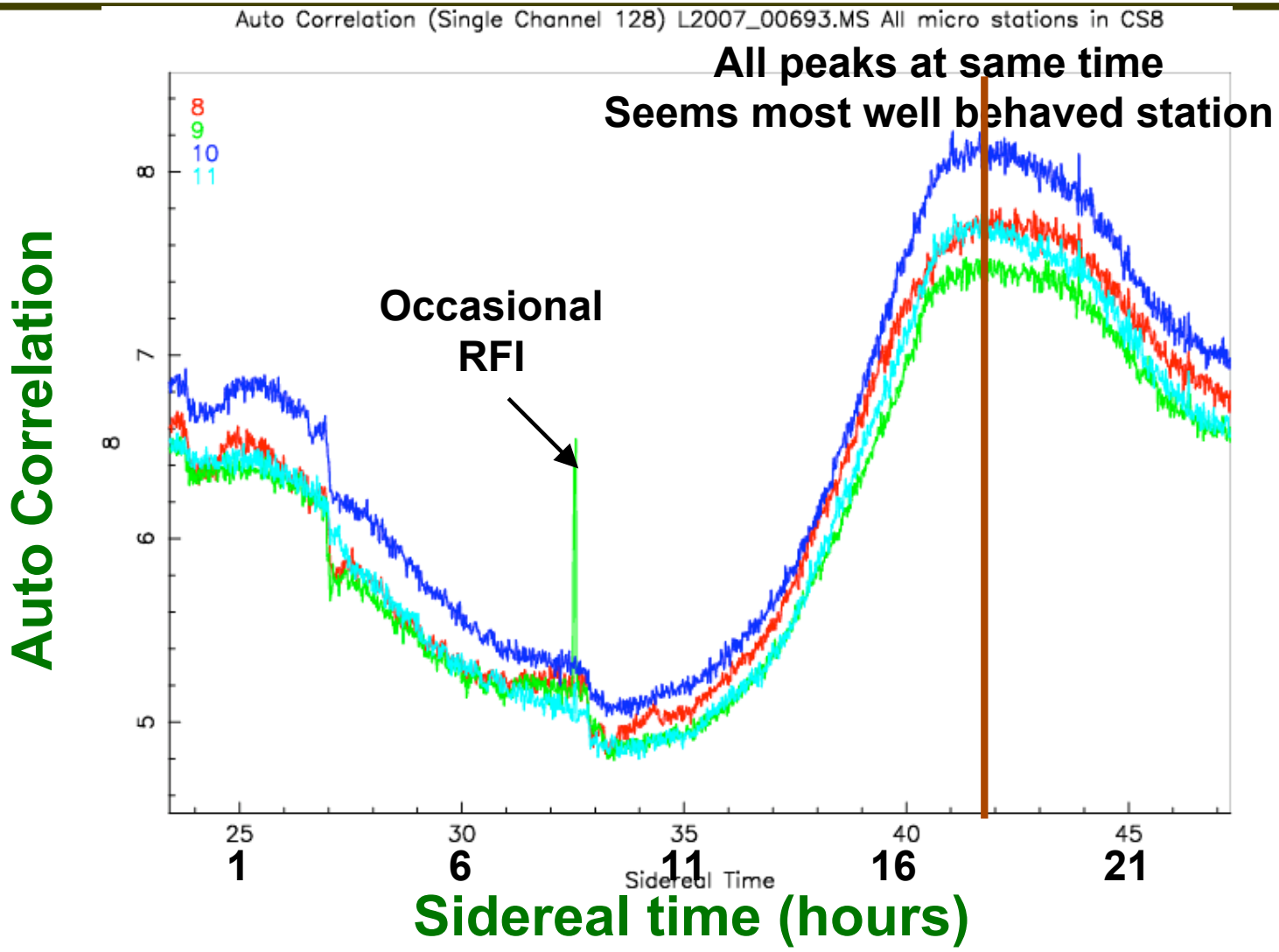
Mainly focus on using Auto correlations to check functionality and stability Issues.

MS693 - Channel 128 CS1

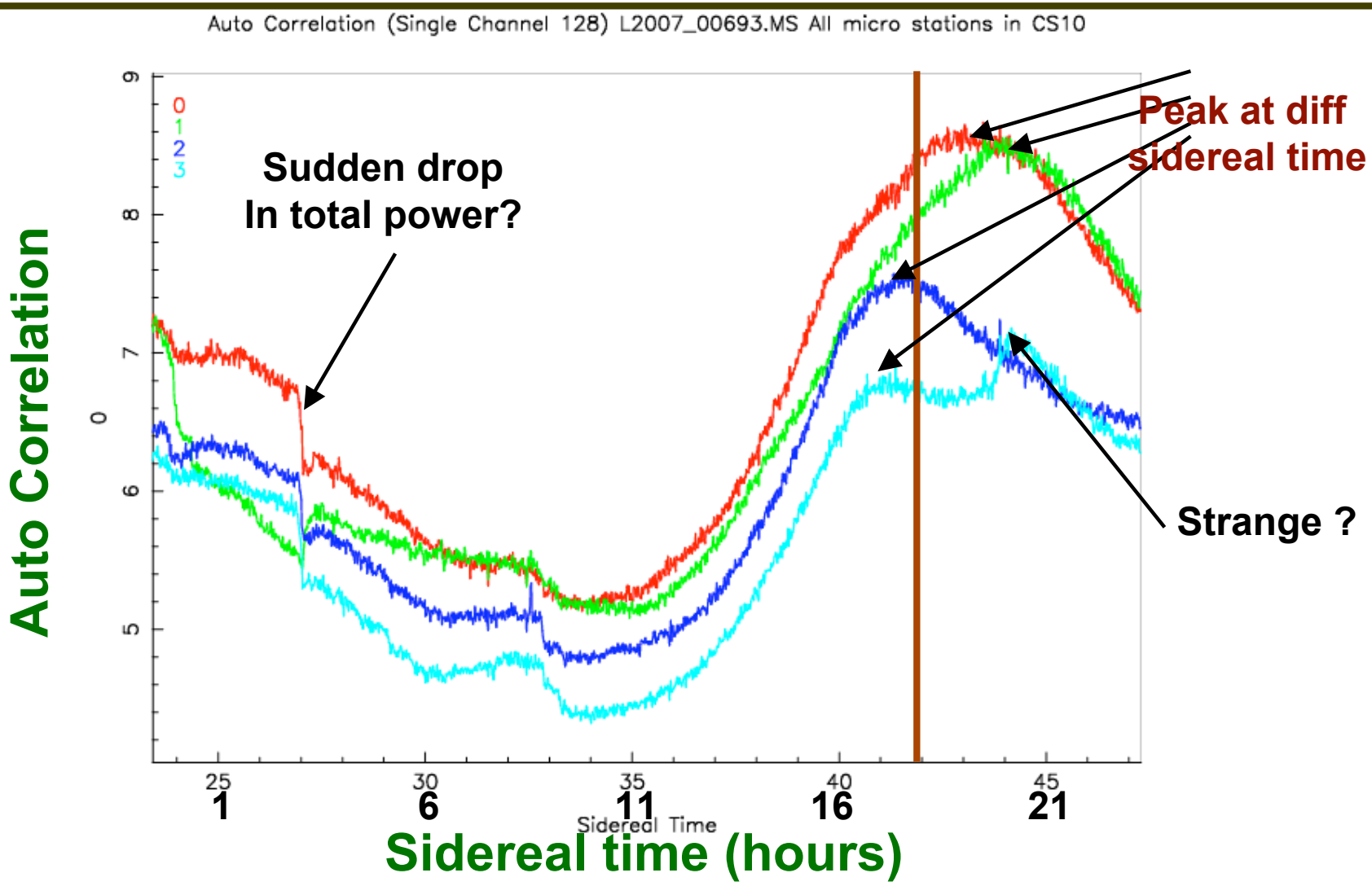
(Jan 05, 2007)
1.8G
(mem issues)



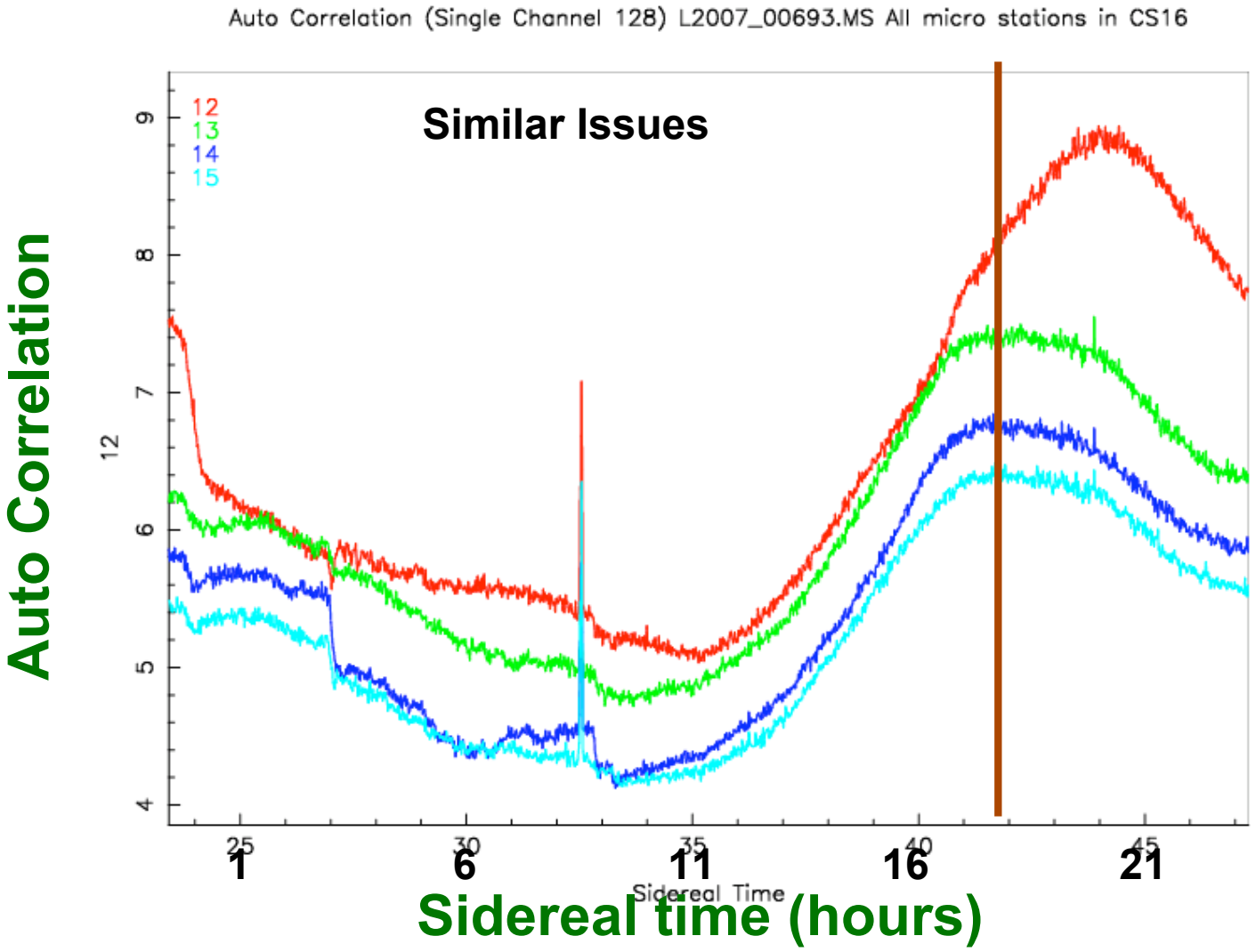
MS693 - Channel 128 CS8



MS693 - Channel 128 CS10

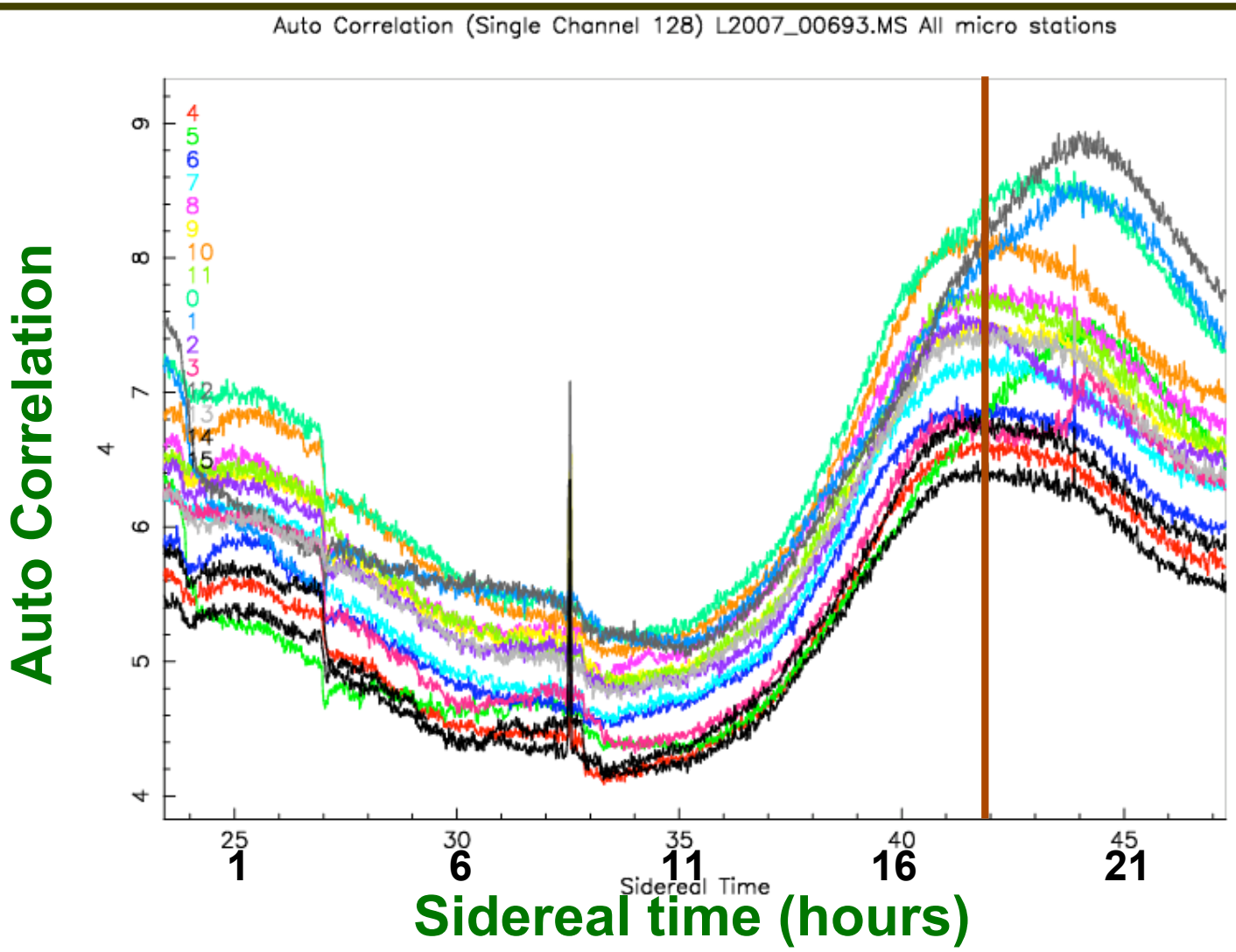


MS693 - Channel 128 CS16



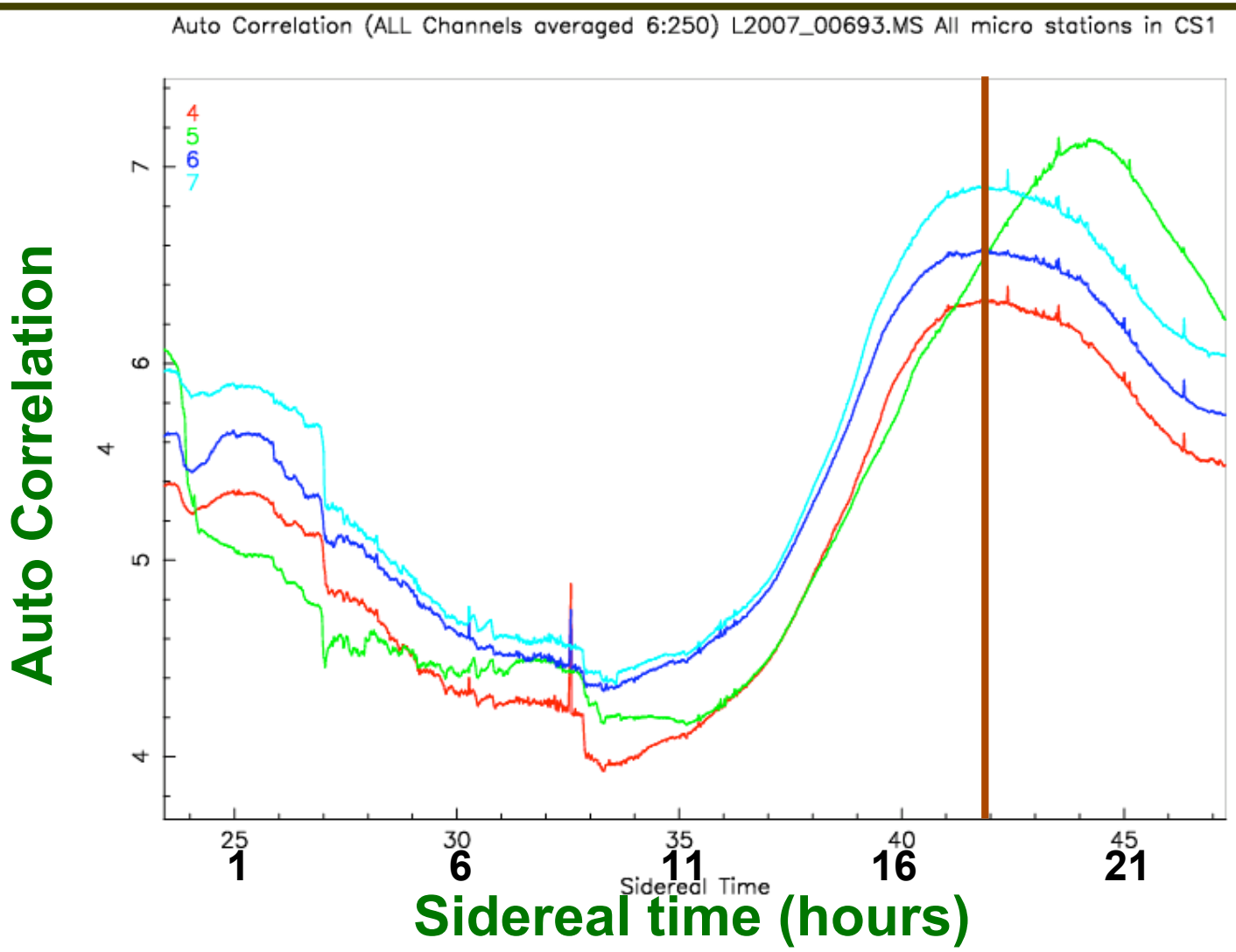
- **All channels show data consistent with each other**

MS693 - Channel 128 , all microstations

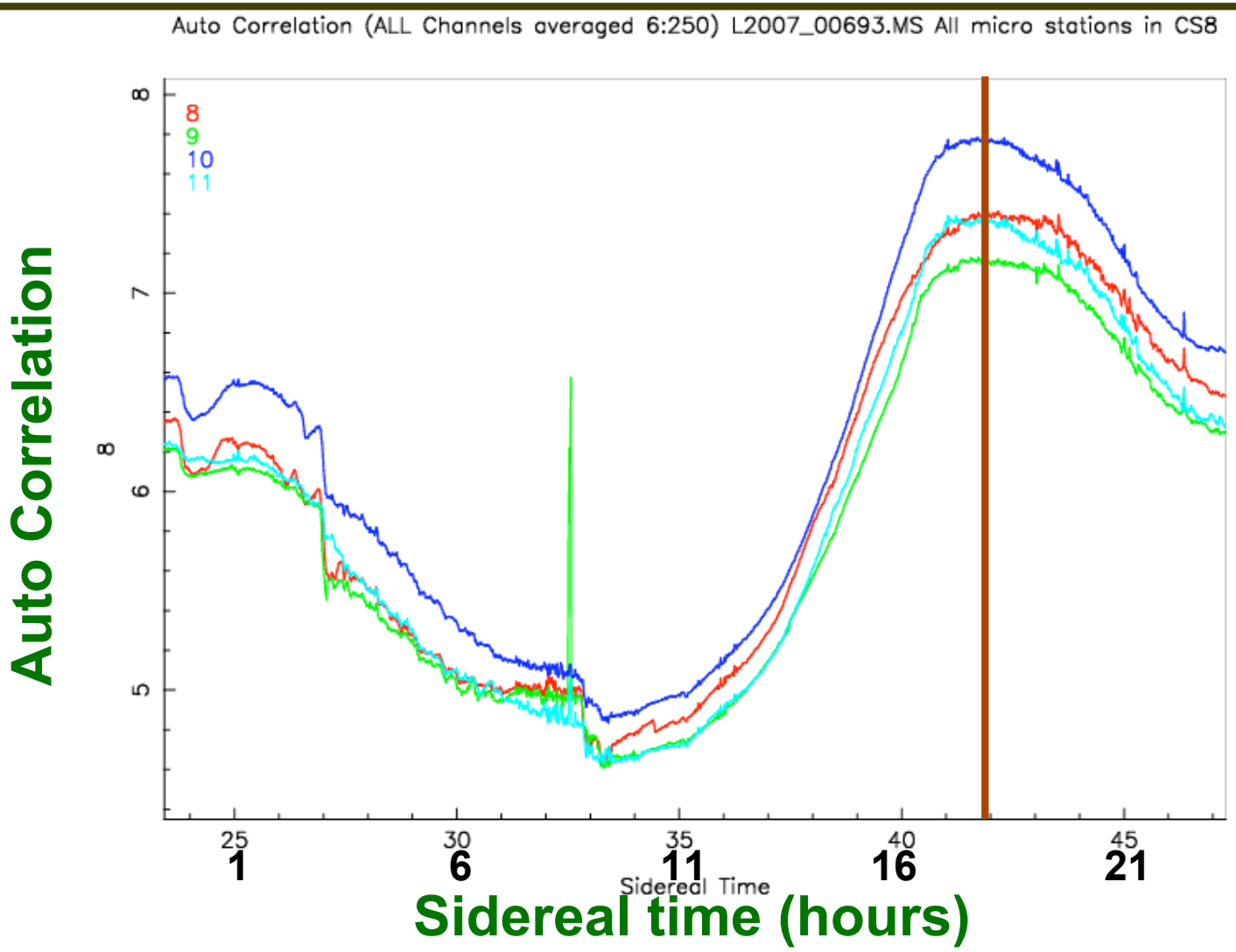


- **All channels show data consistent with each other**

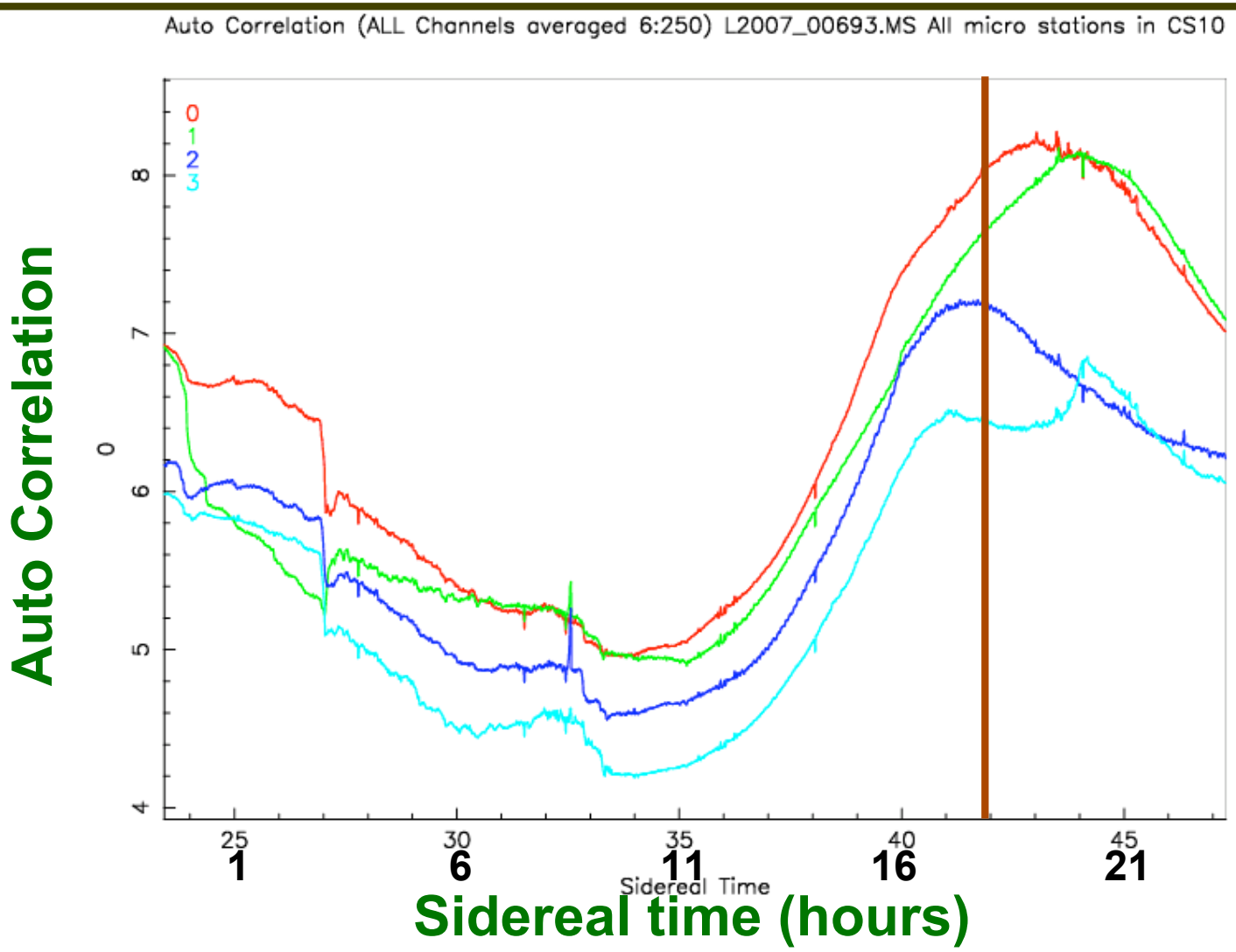
MS693 - Avg (Ch 6:250) CS1



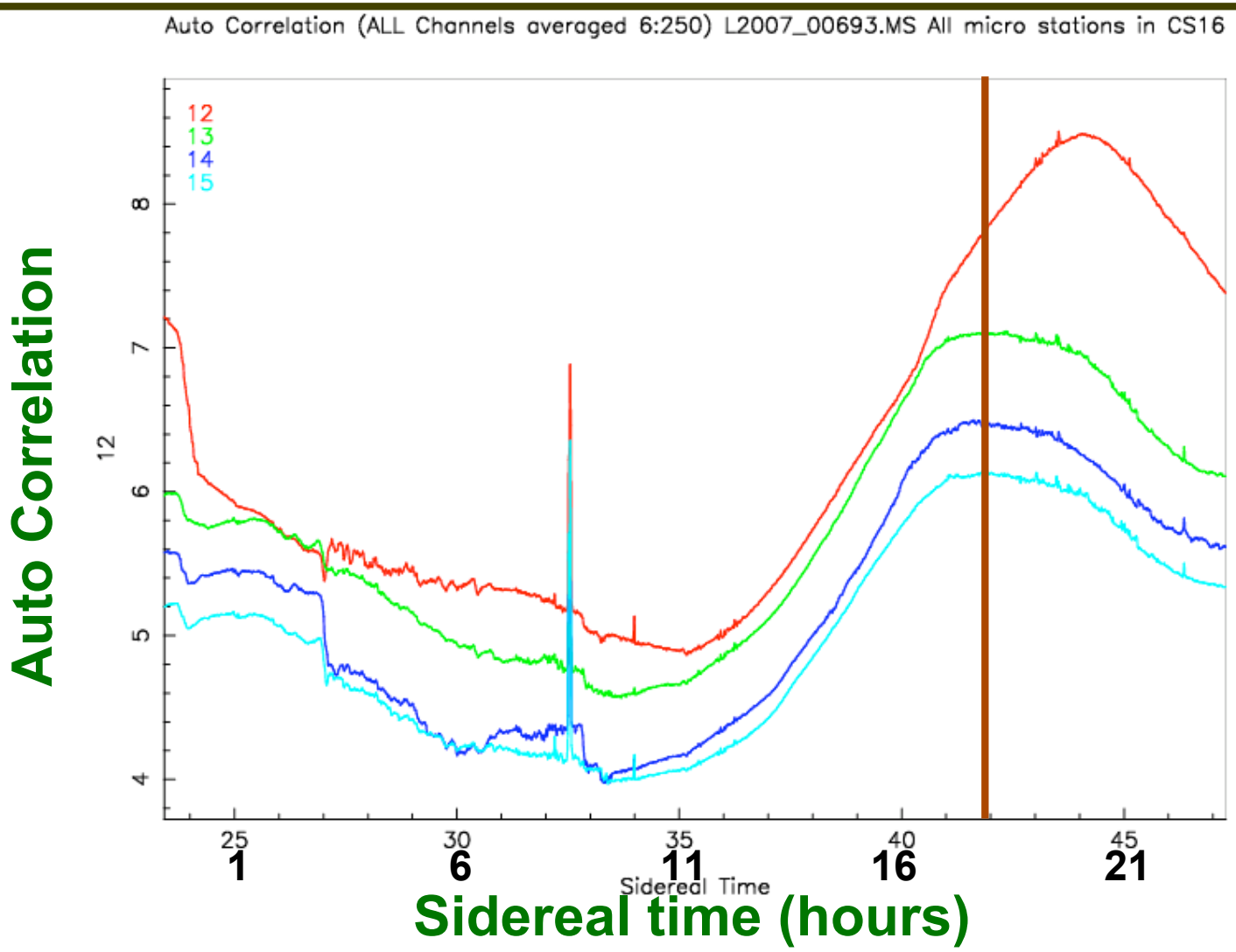
MS693 - Avg (Ch 6:250) CS8



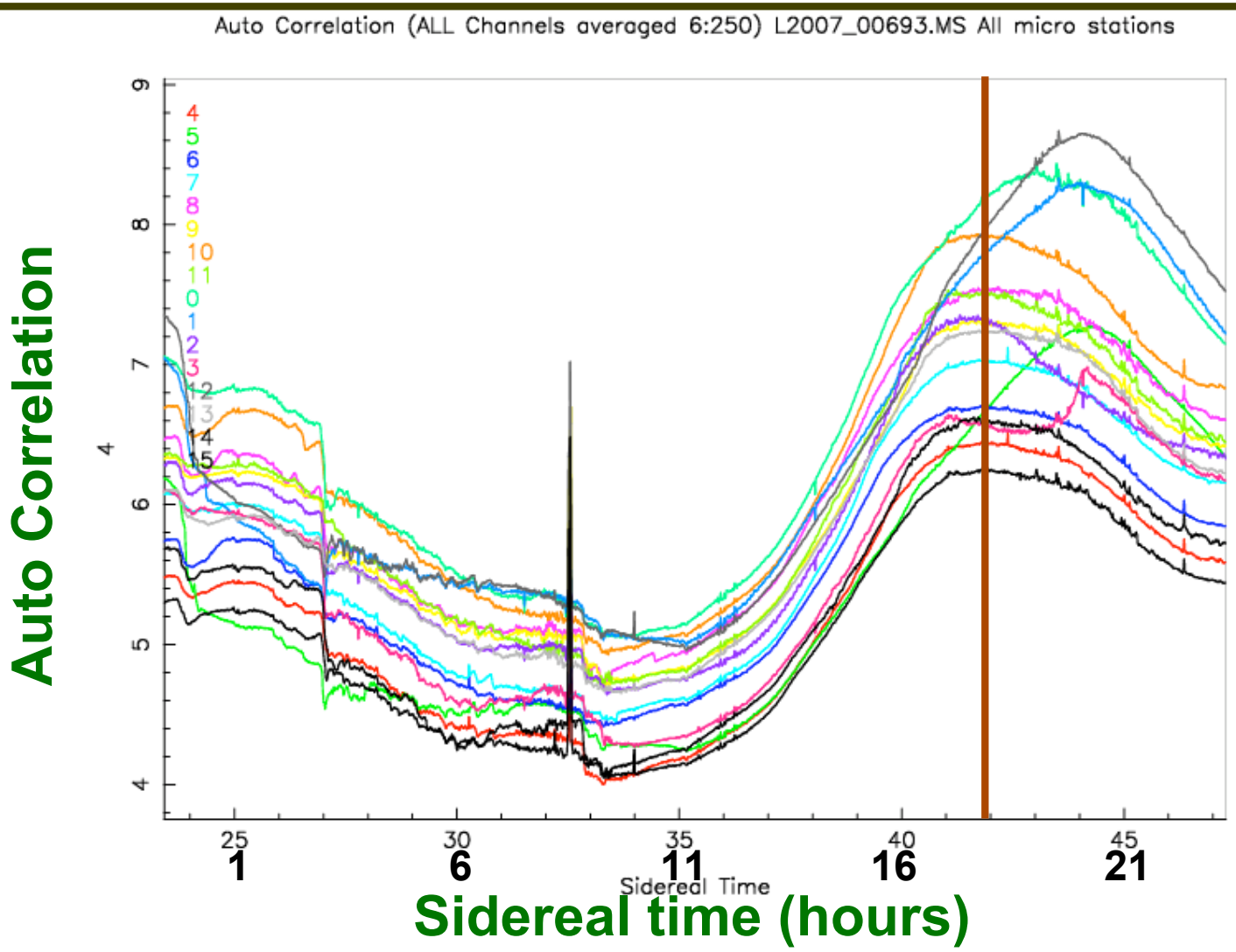
MS693 - Avg (Ch 6:250) CS10



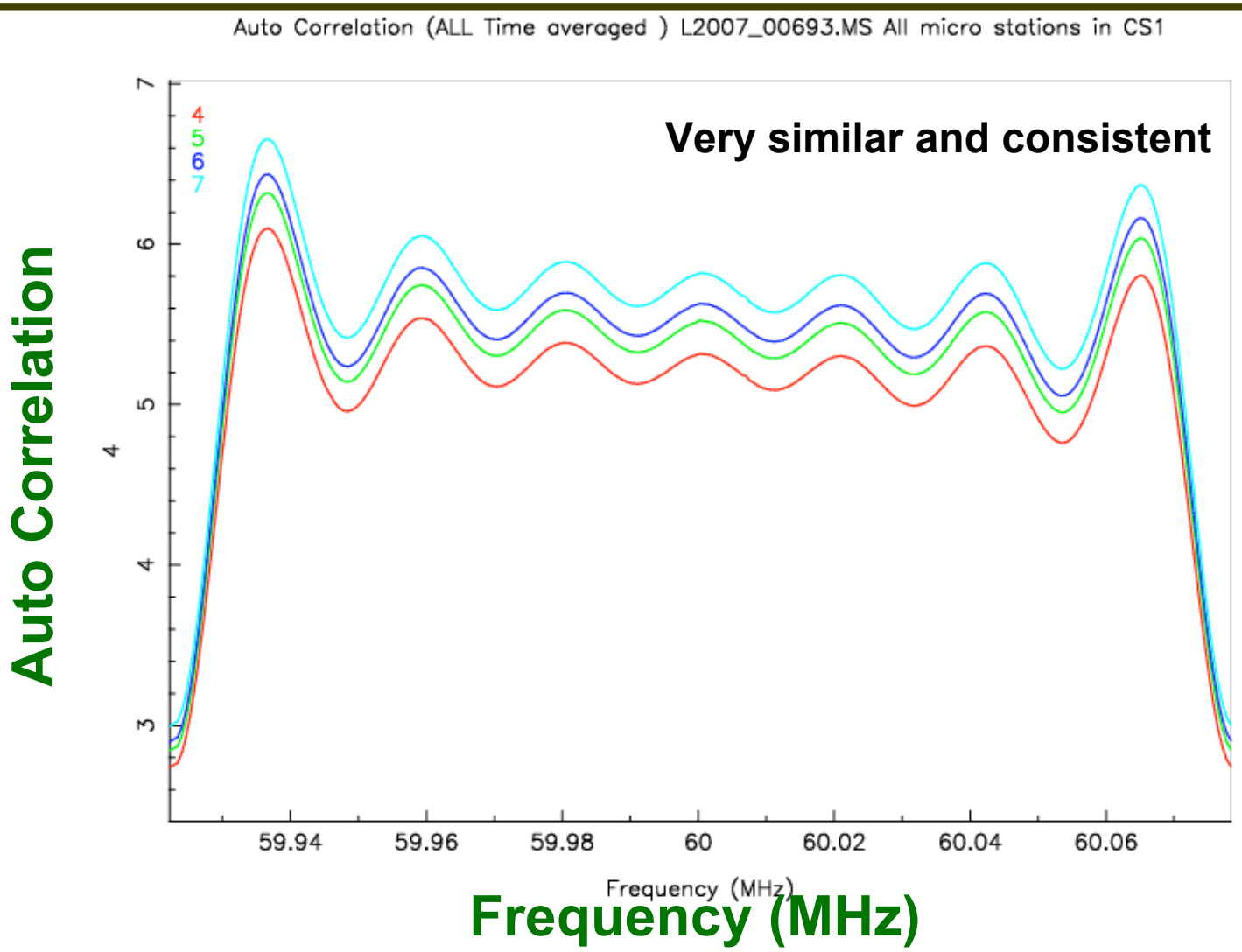
MS693 - Avg (Ch 6:250) CS16



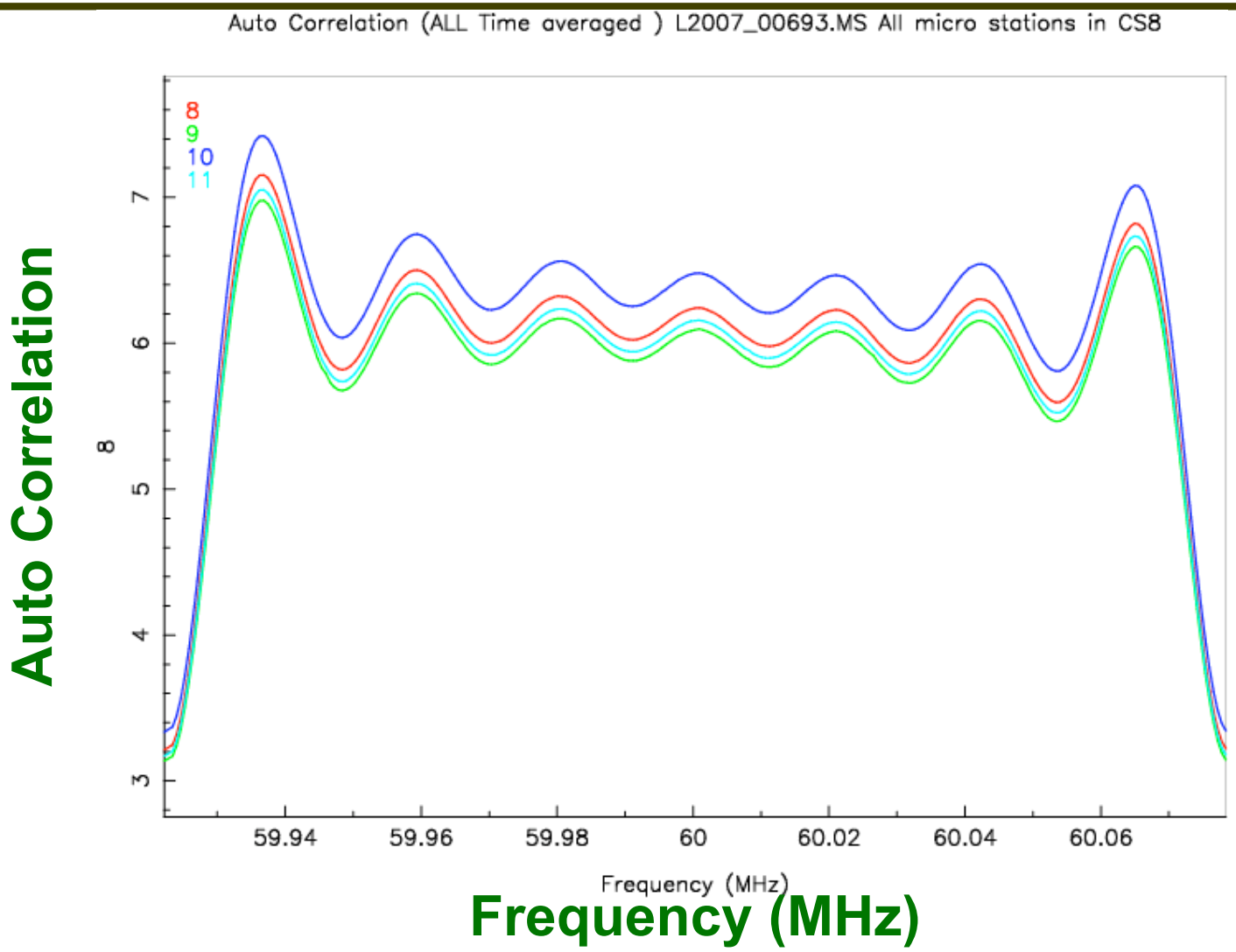
MS693 - Avg (Ch 6:250) all microstns



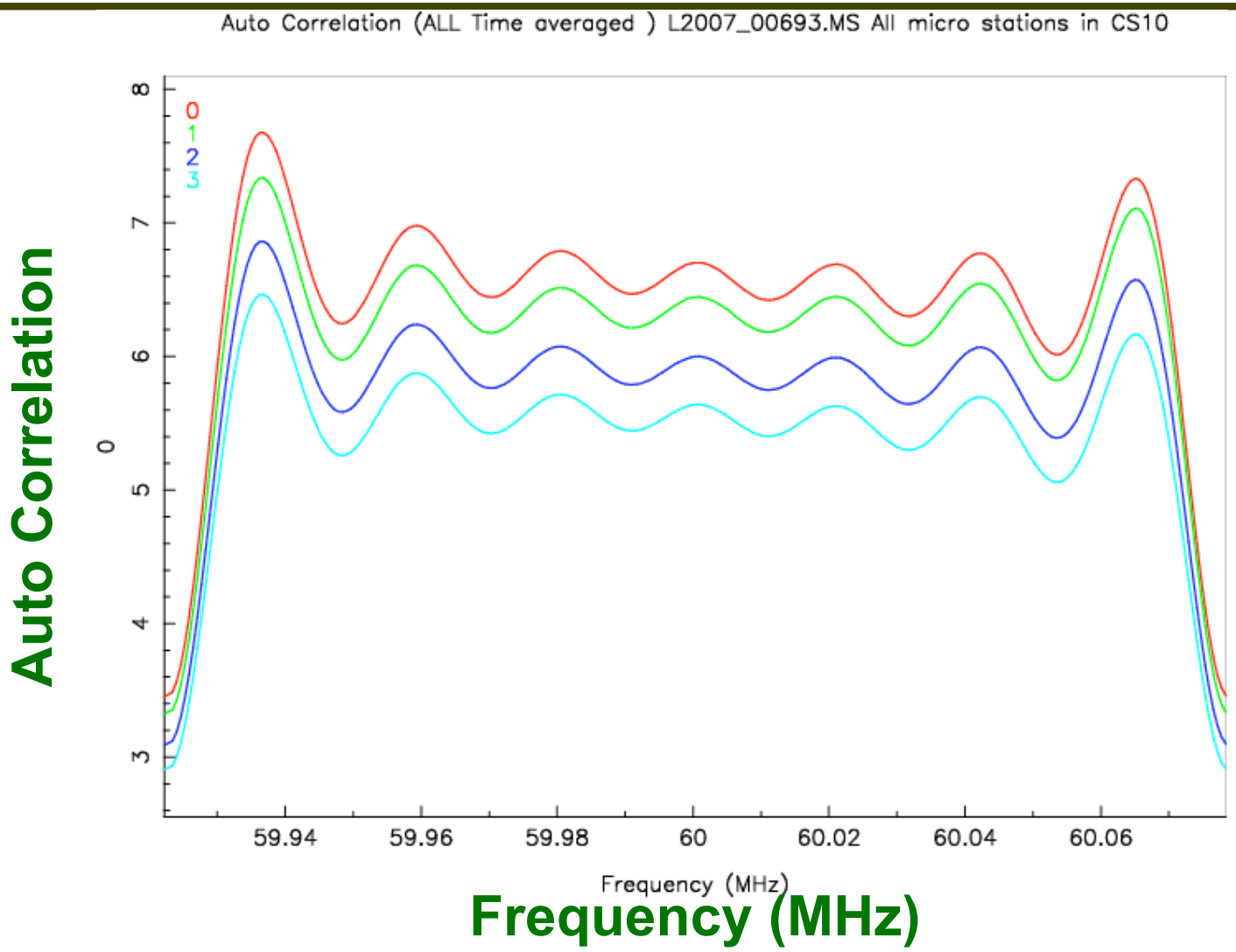
MS693: Bandpass (time averaged) CS1



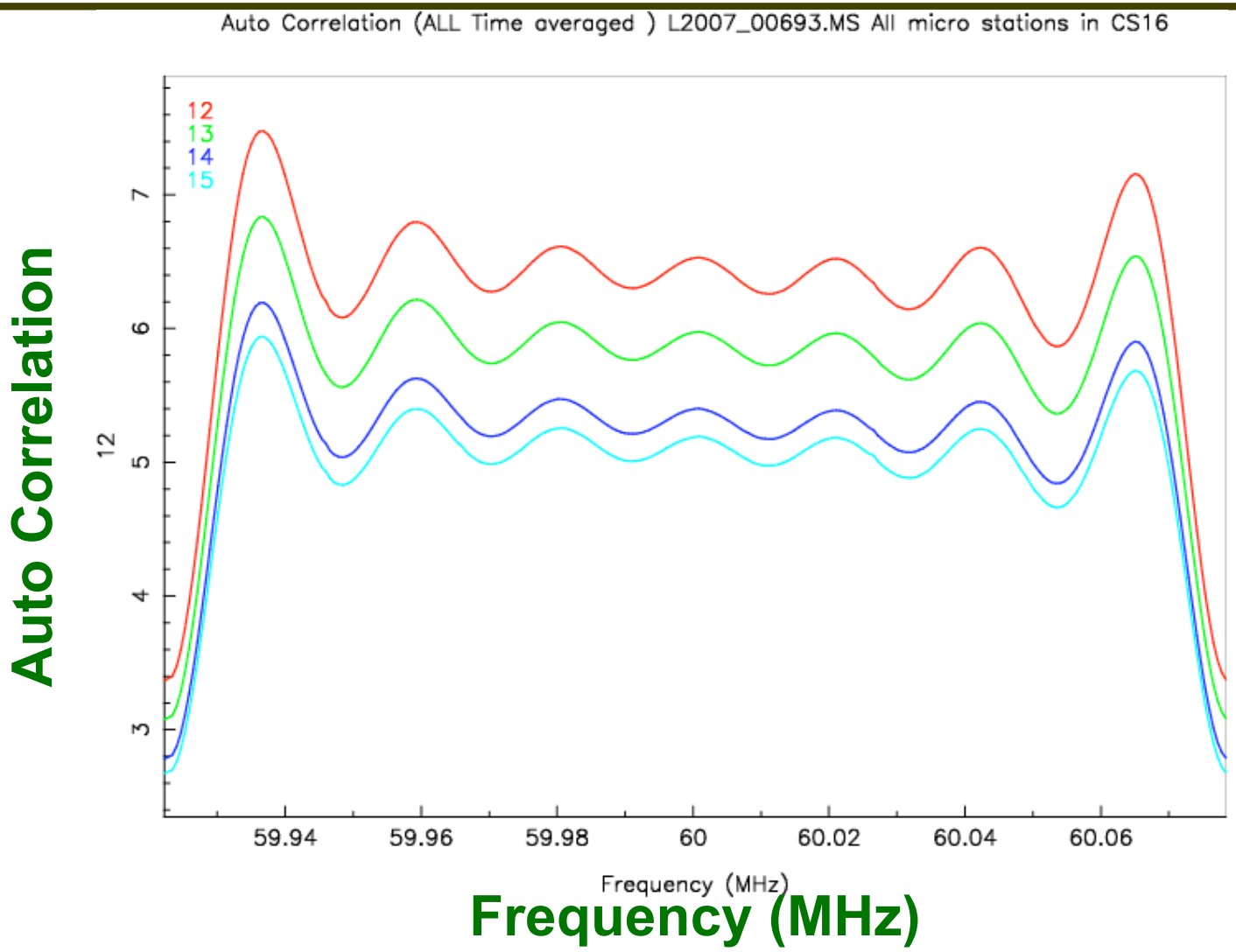
MS693: Bandpass (time averaged) CS8



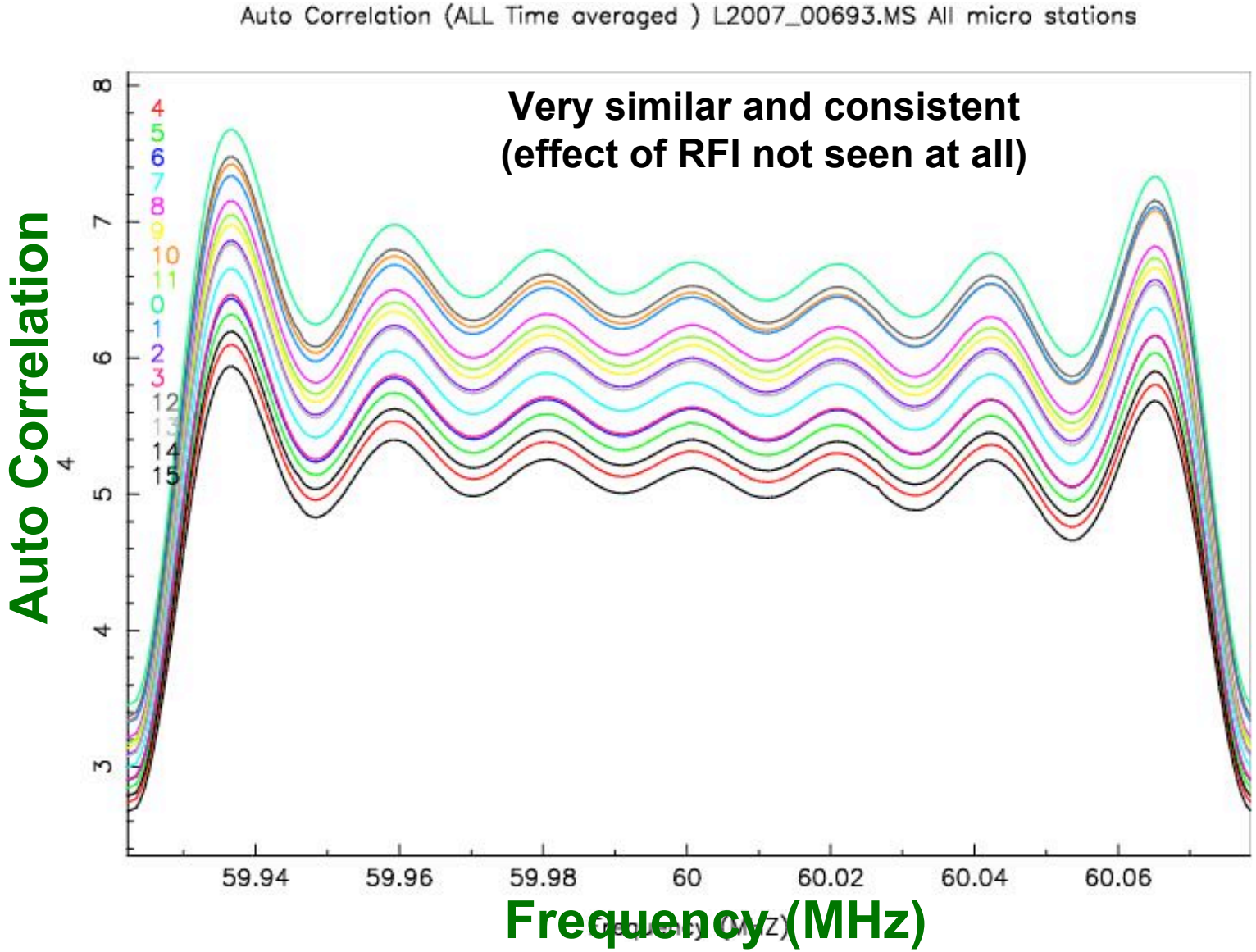
MS693: Bandpass (time averaged) CS10



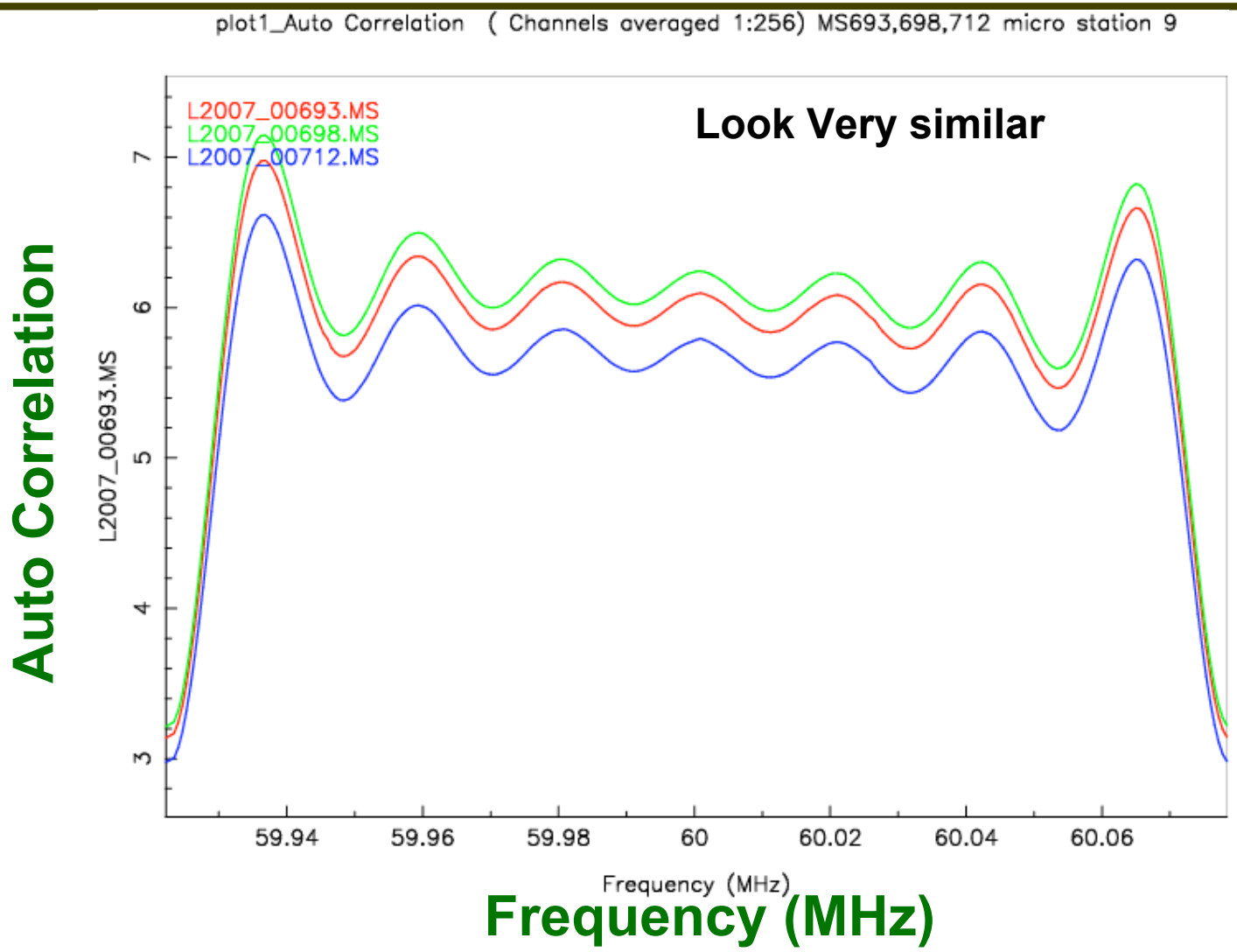
MS693: Bandpass (time averaged) CS16



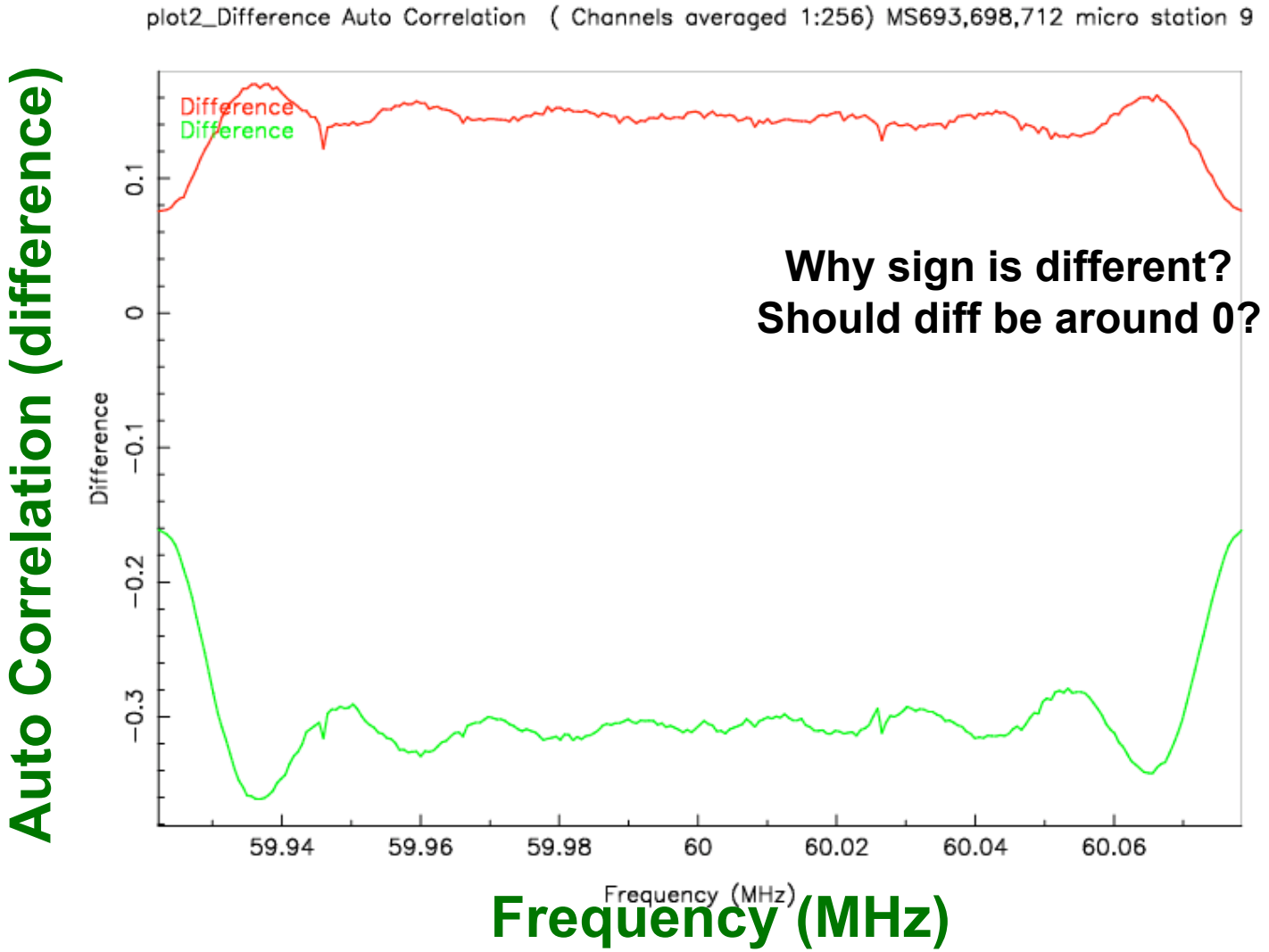
MS693: Bandpass (time averaged) all microstn



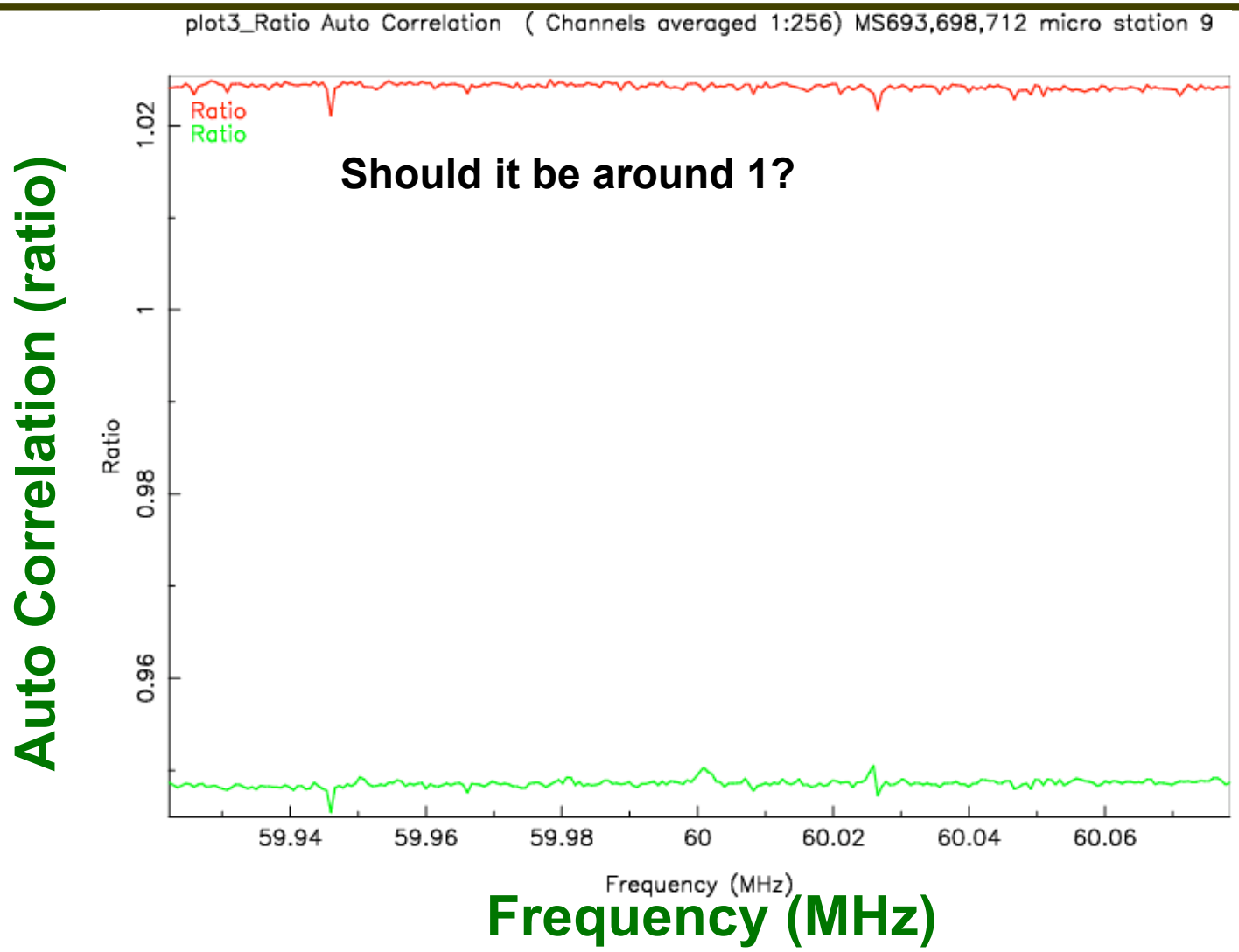
MS712/698/MS693 Bandpass(diff days): MStn9



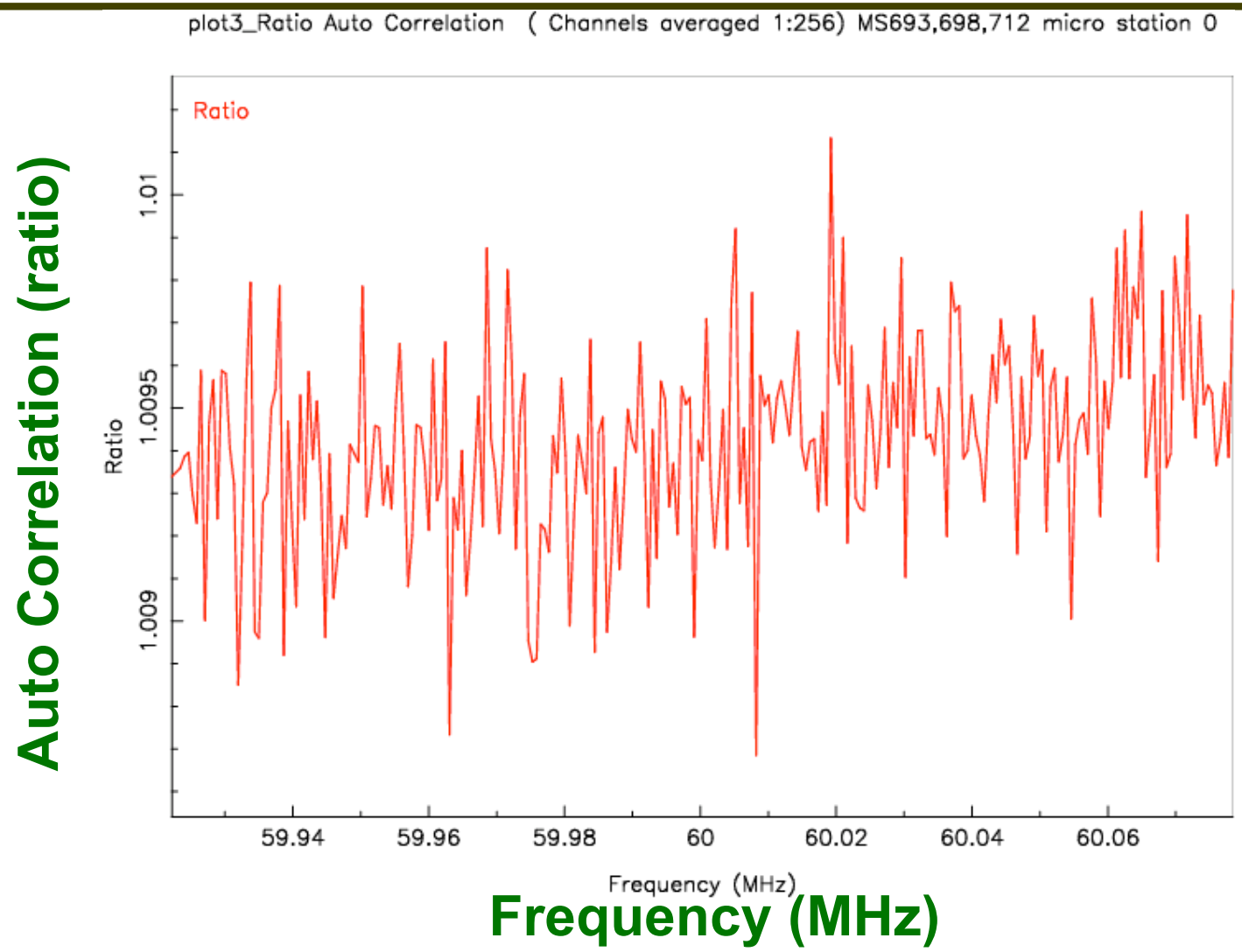
MS712/698/MS693 Bandpass diff: Mstn9



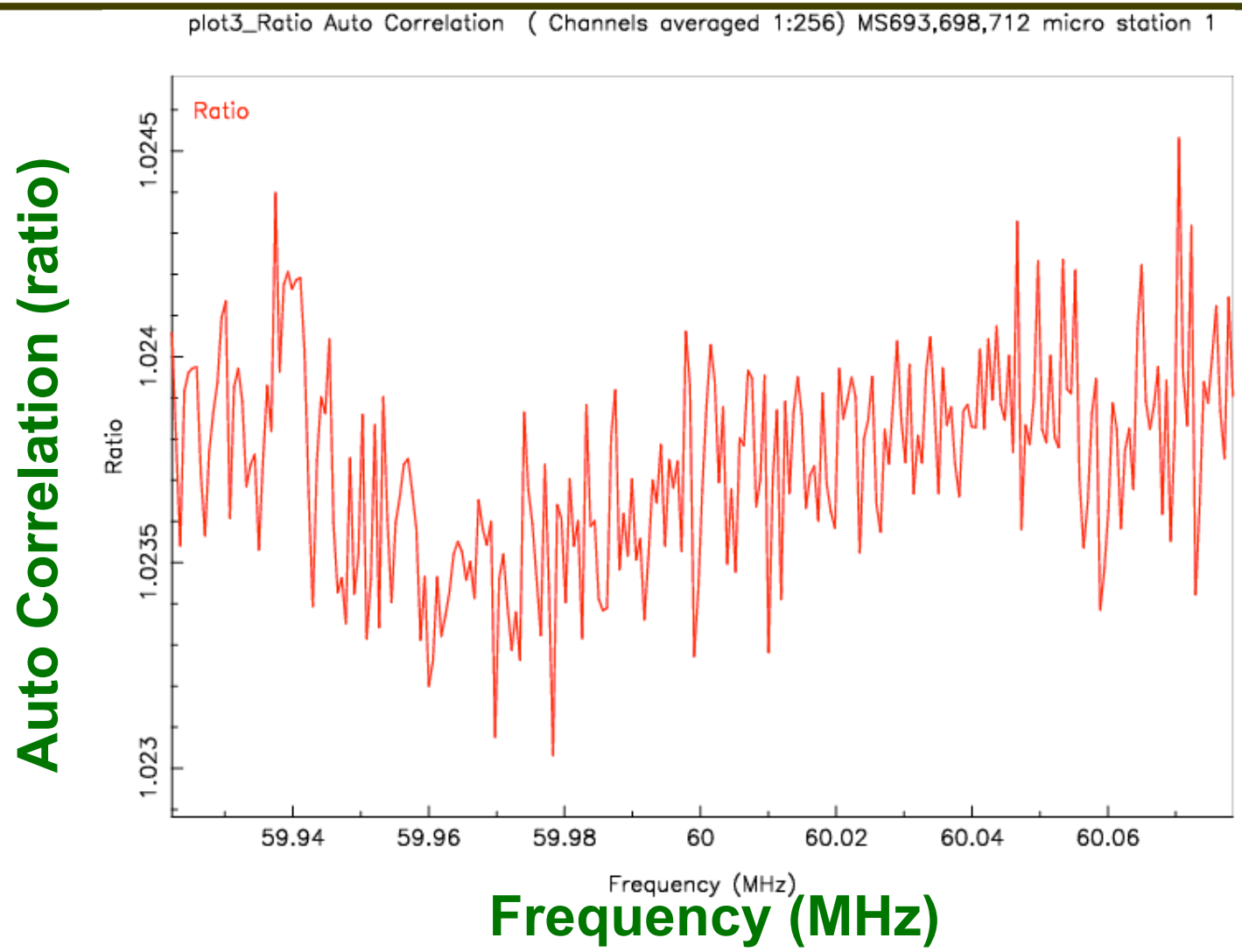
MS712/698/MS693 Bandpass ratio: mstn9



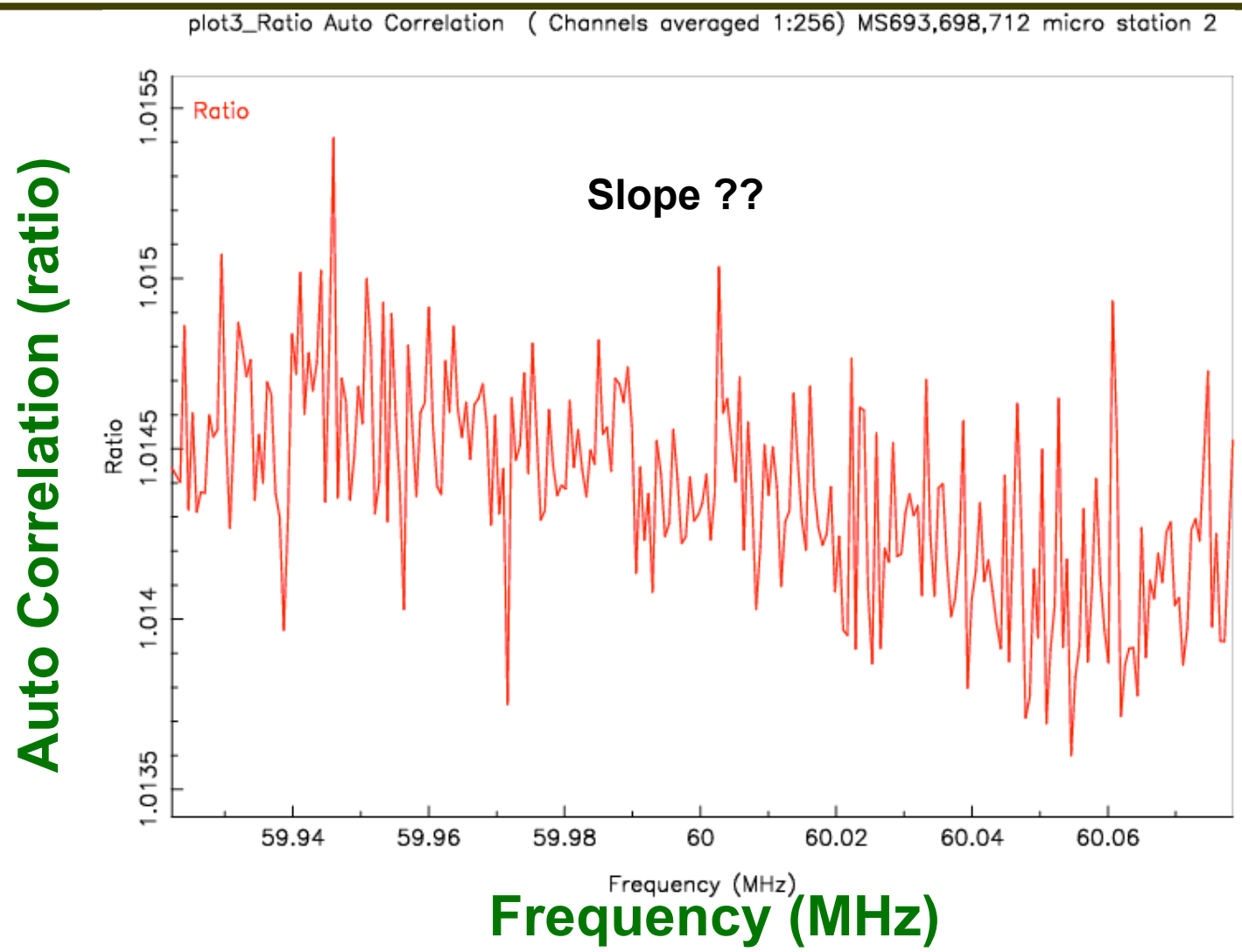
Bandpass stability -R- MStn 0 - MS698/MS693



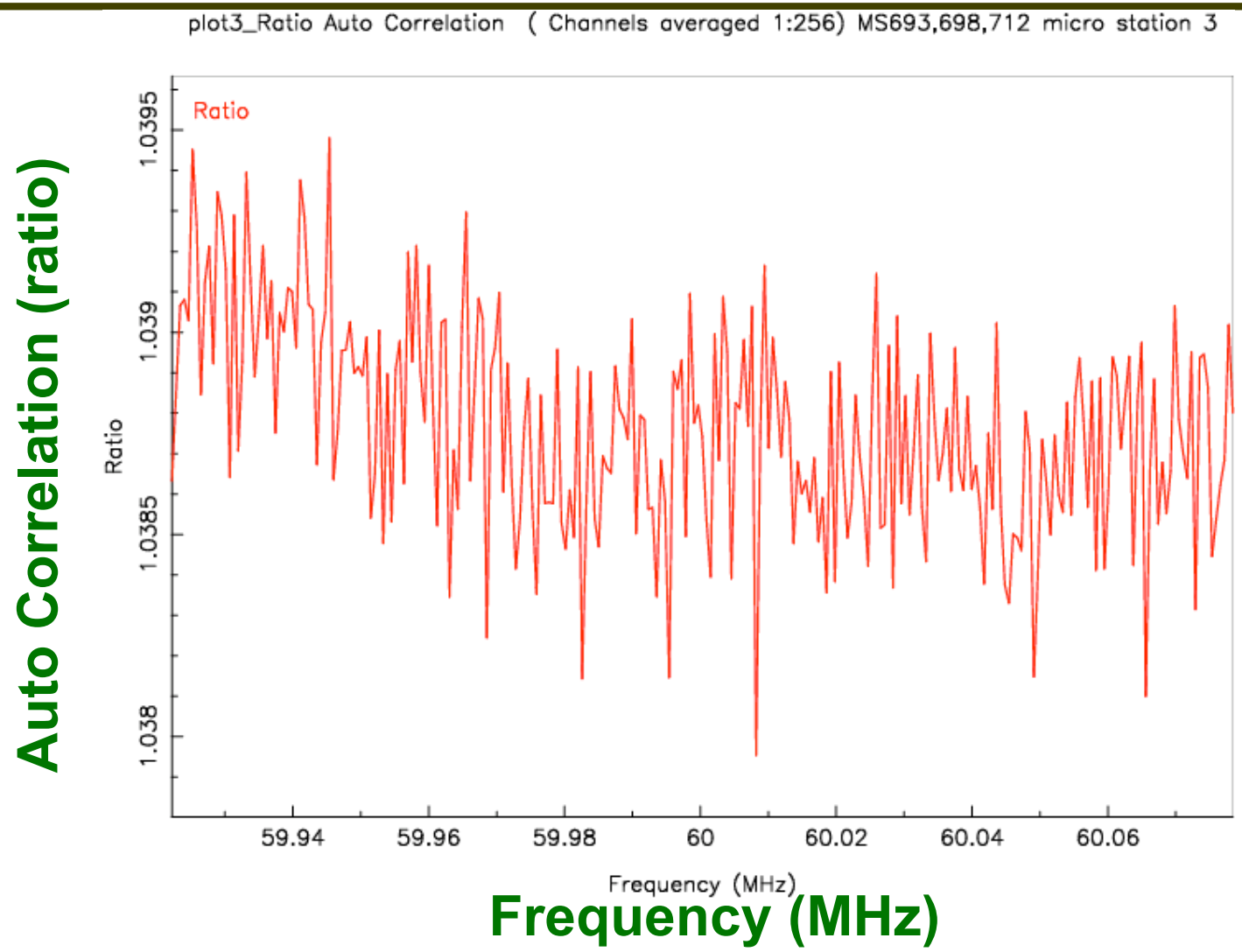
Bandpass stability - R MStn 1 - MS698/MS693



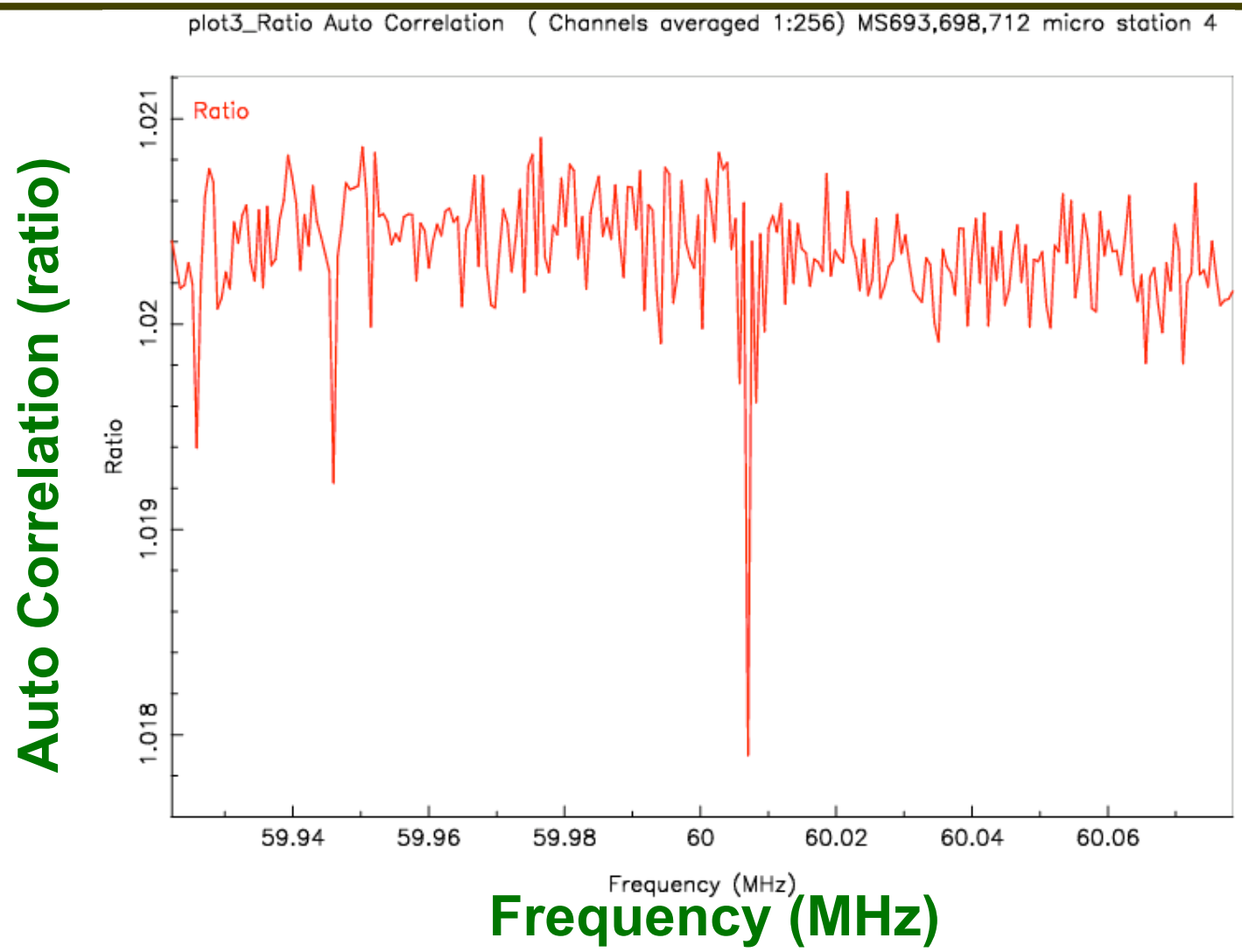
Bandpass stability - R MStn 2 - MS698/MS693



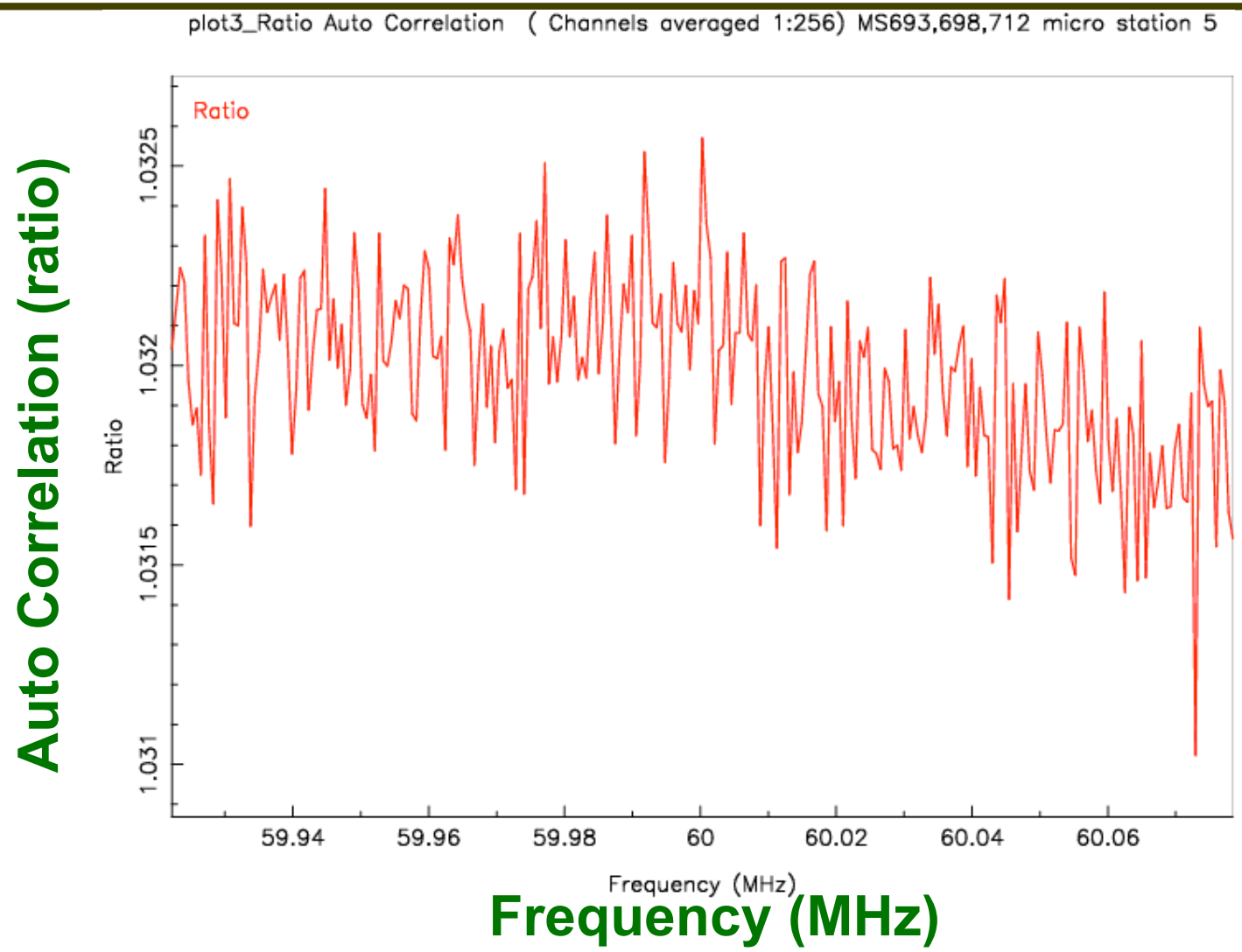
Bandpass stability - R MStn 3 - MS698/MS693



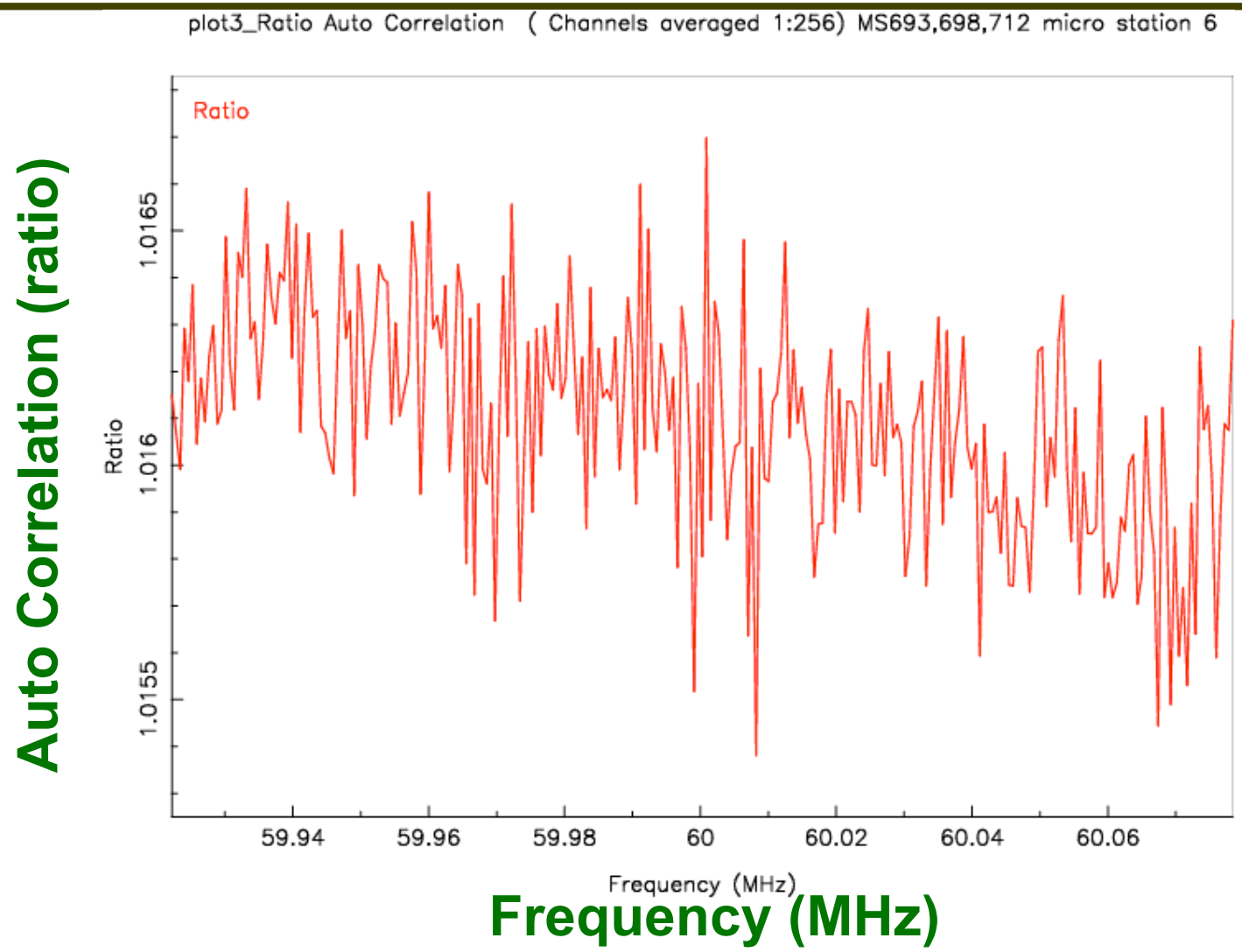
Bandpass stability - R MStn 4 - MS698/MS693



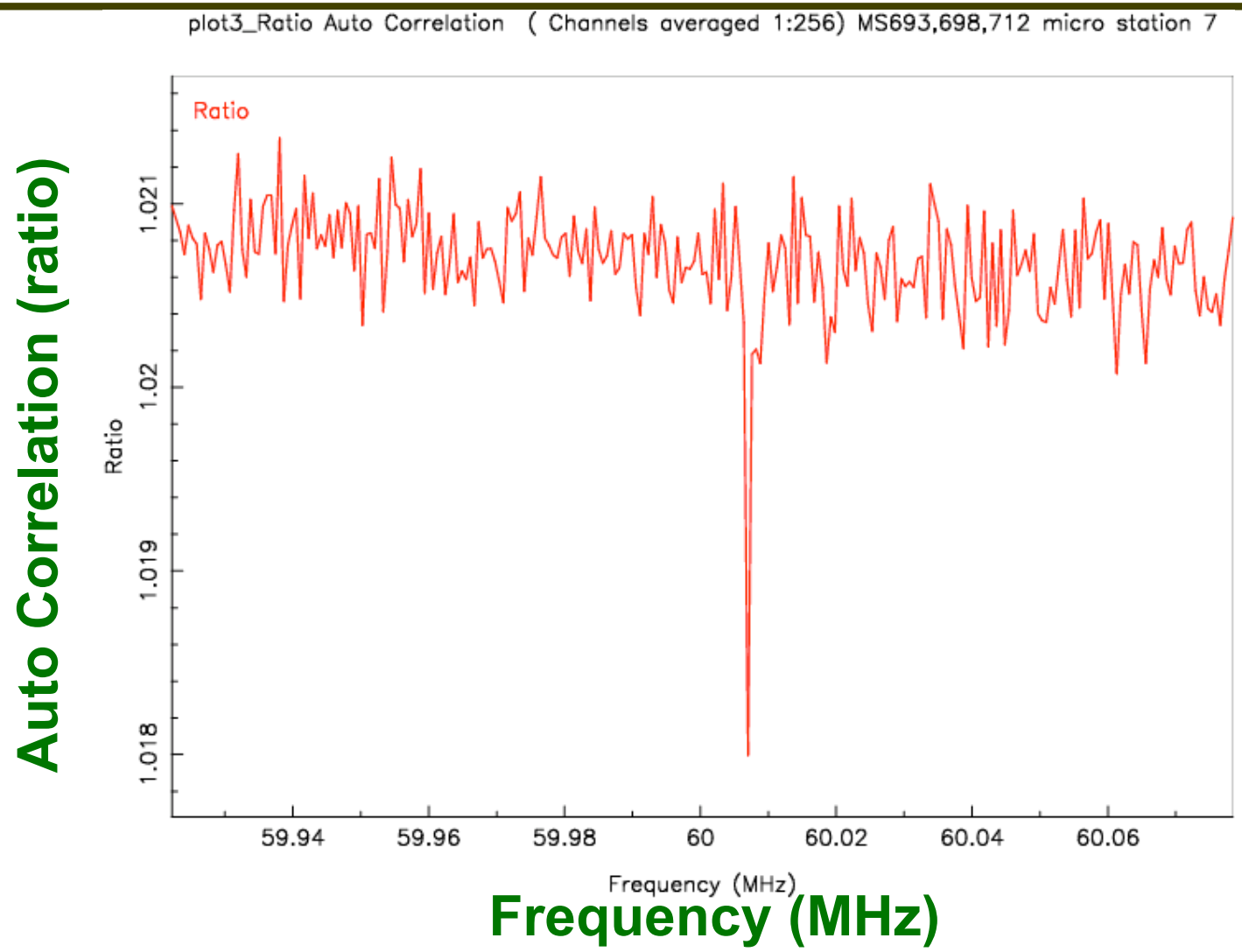
Bandpass stability - R MStn 5 - MS698/MS693



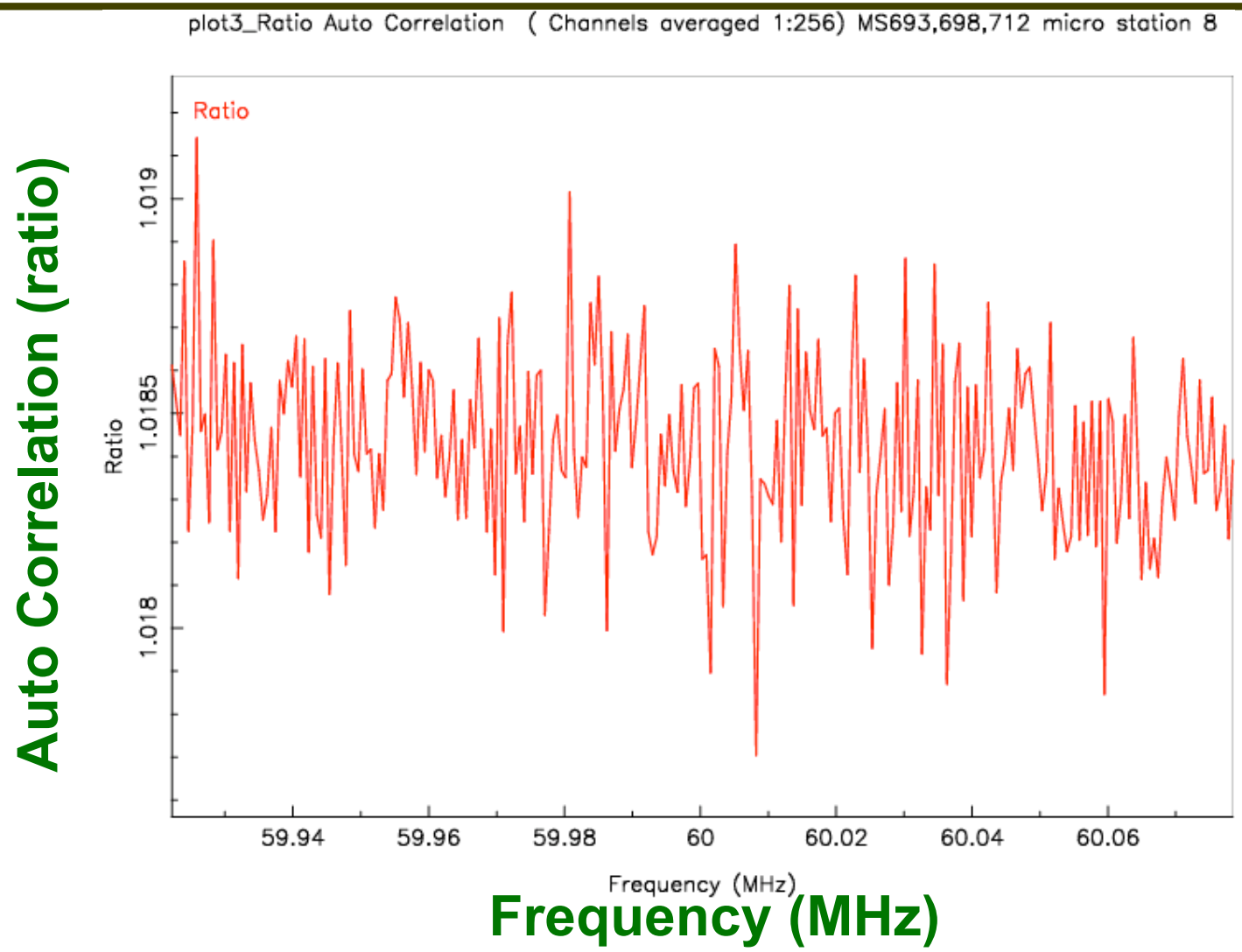
Bandpass stability - R MStn 6 - MS698/MS693



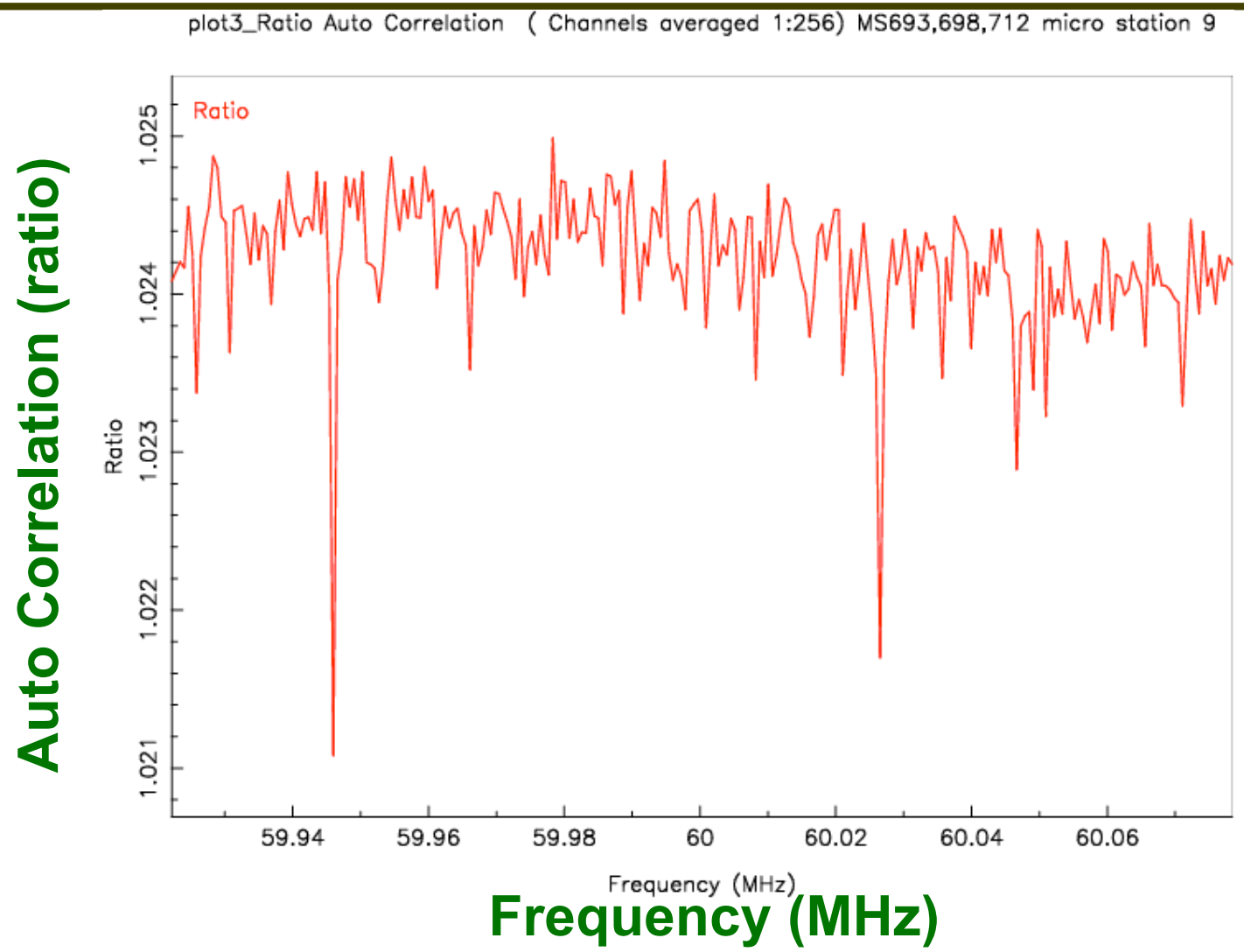
Bandpass stability - R MStn 7 - MS698/MS693



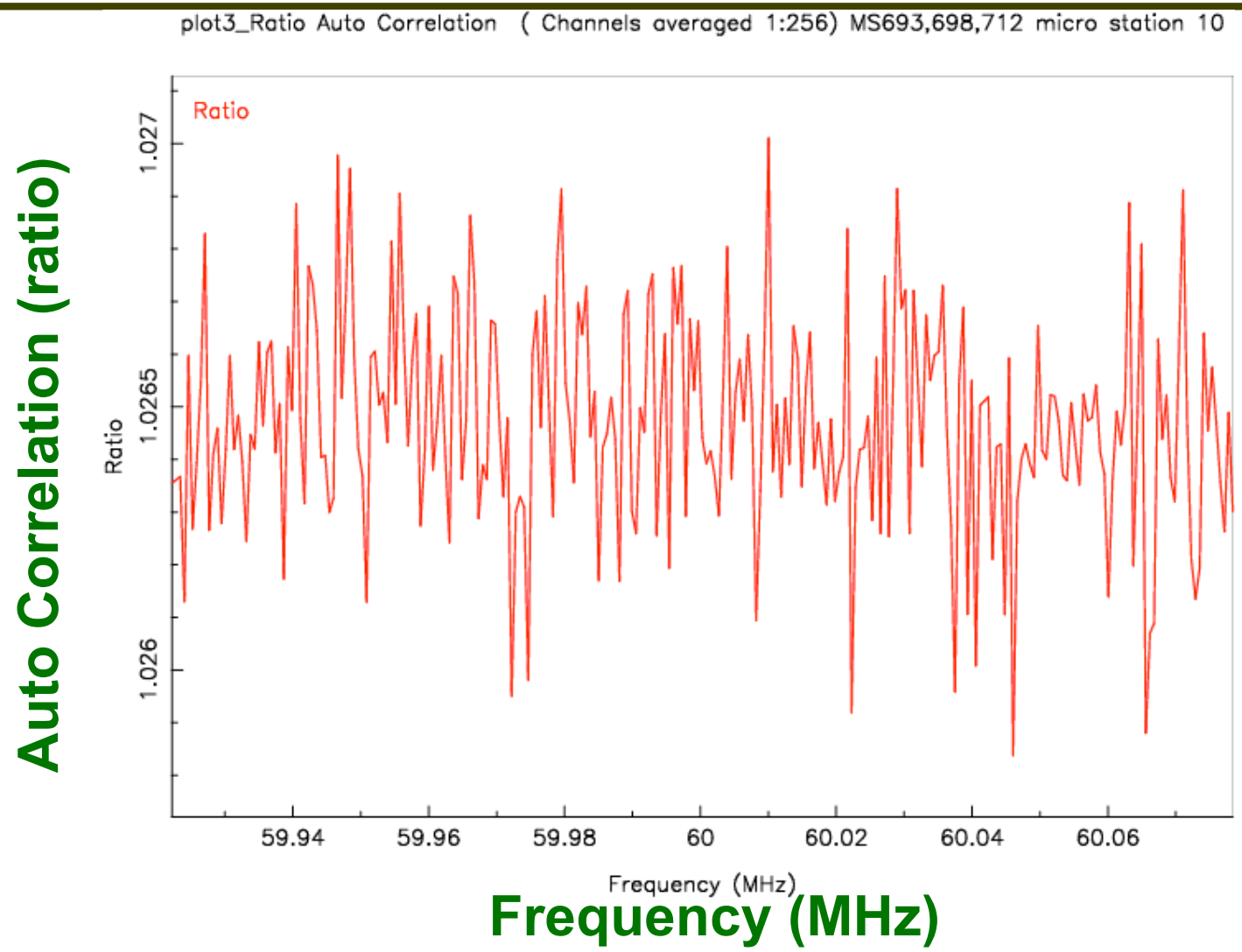
Bandpass stability - R MStn 8 - MS698/MS693



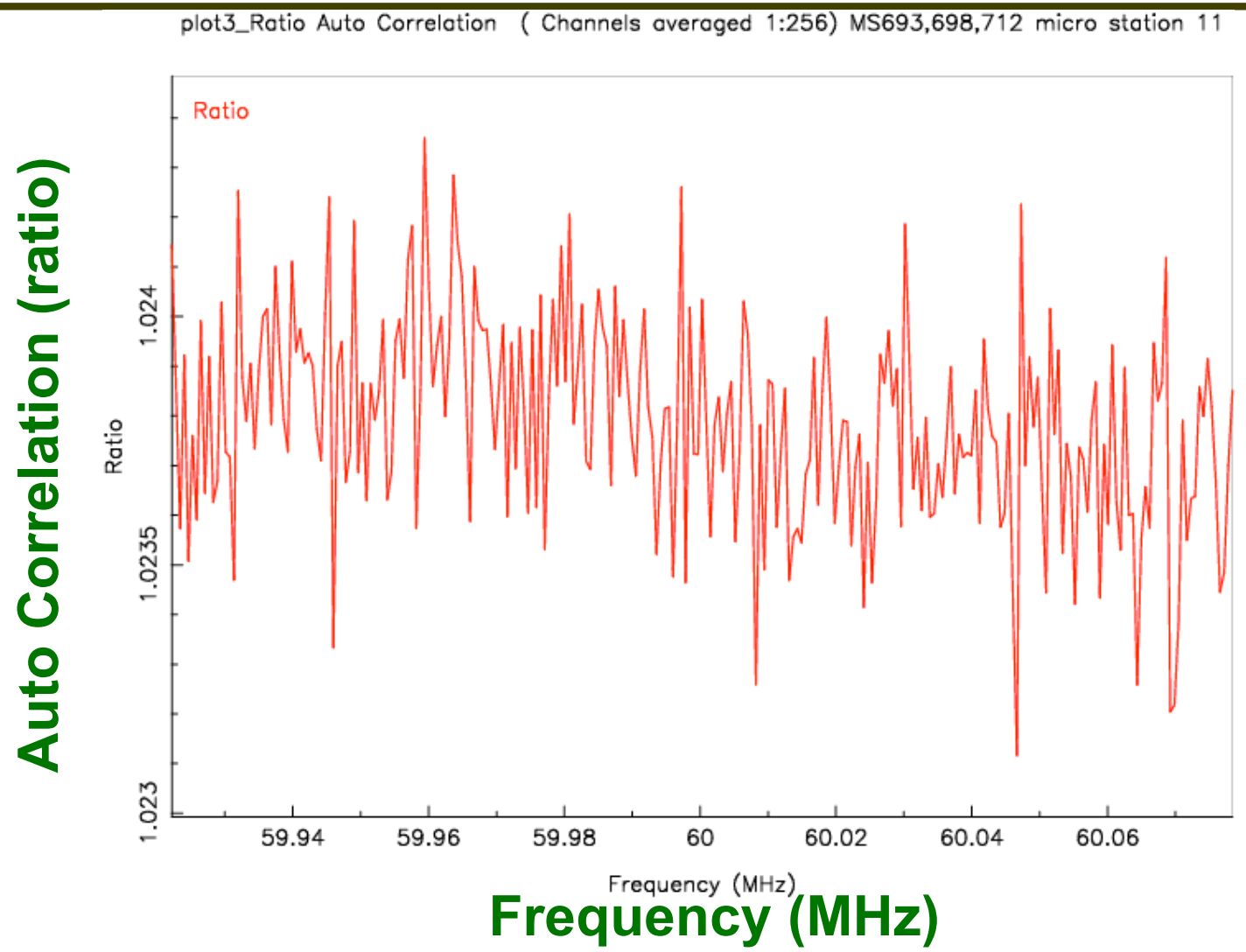
Bandpass stability - R MStn 9 - MS698/MS693



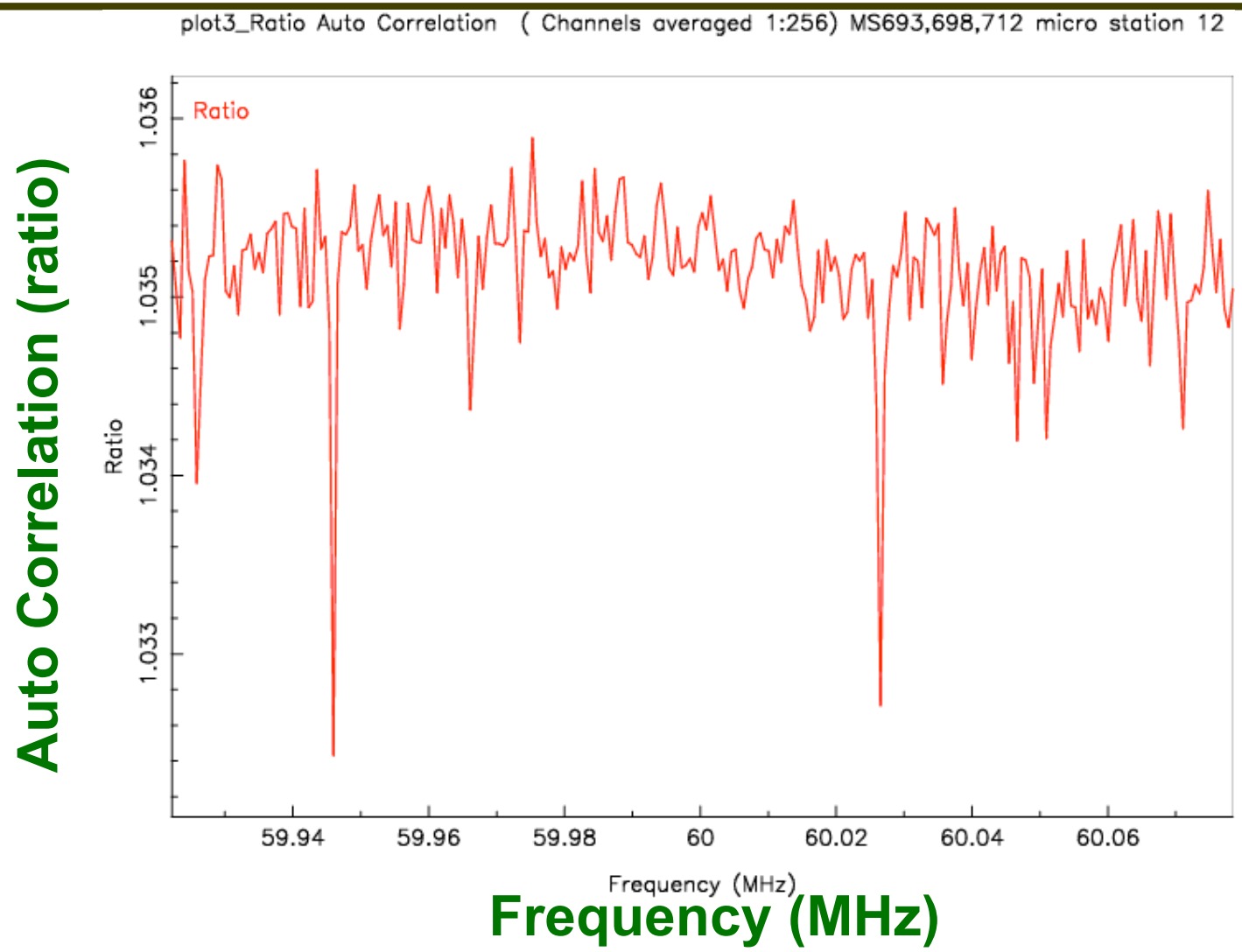
Bandpass stability - R MStn 10 - MS698/MS693



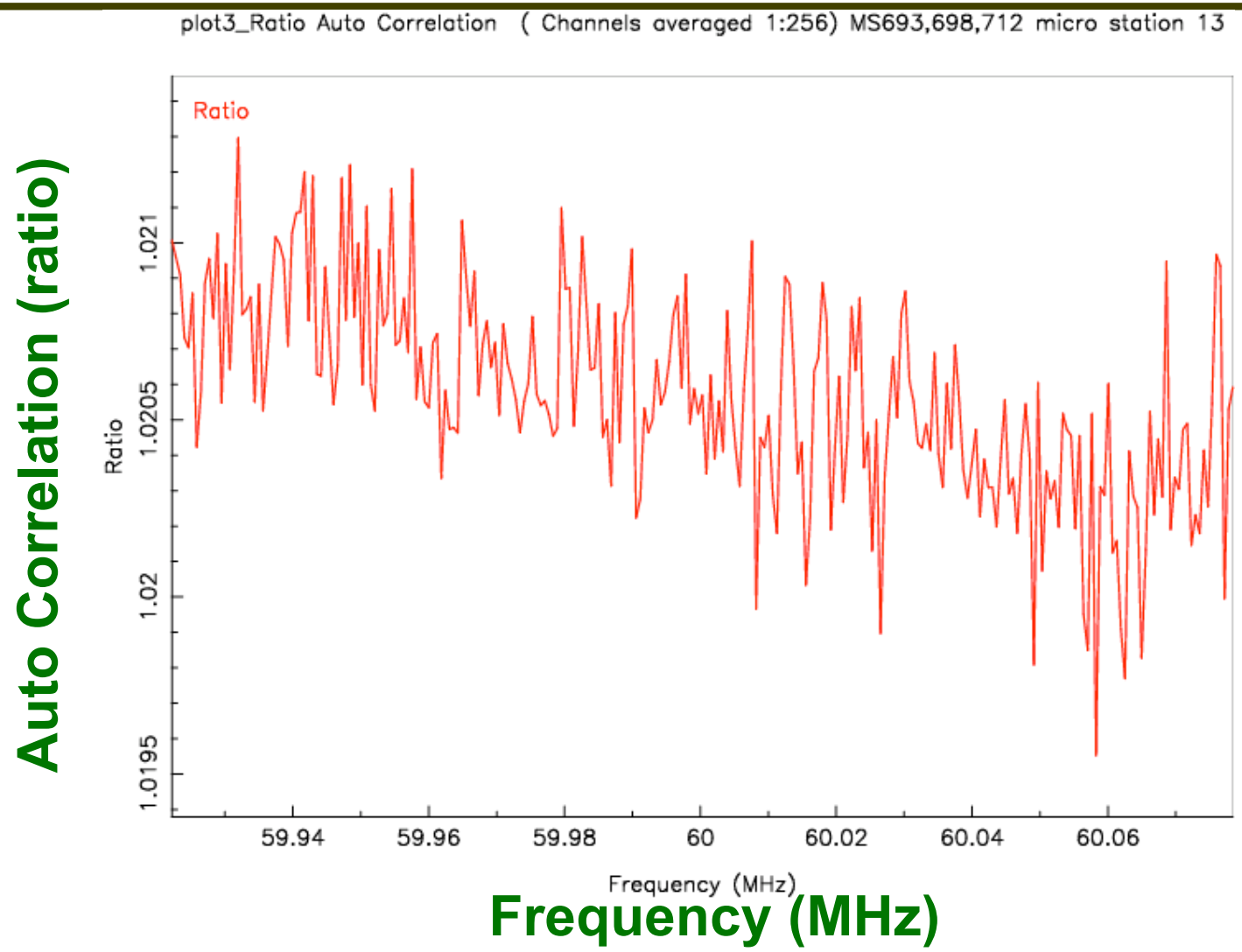
Bandpass stability - R MStn 11 MS698/MS693



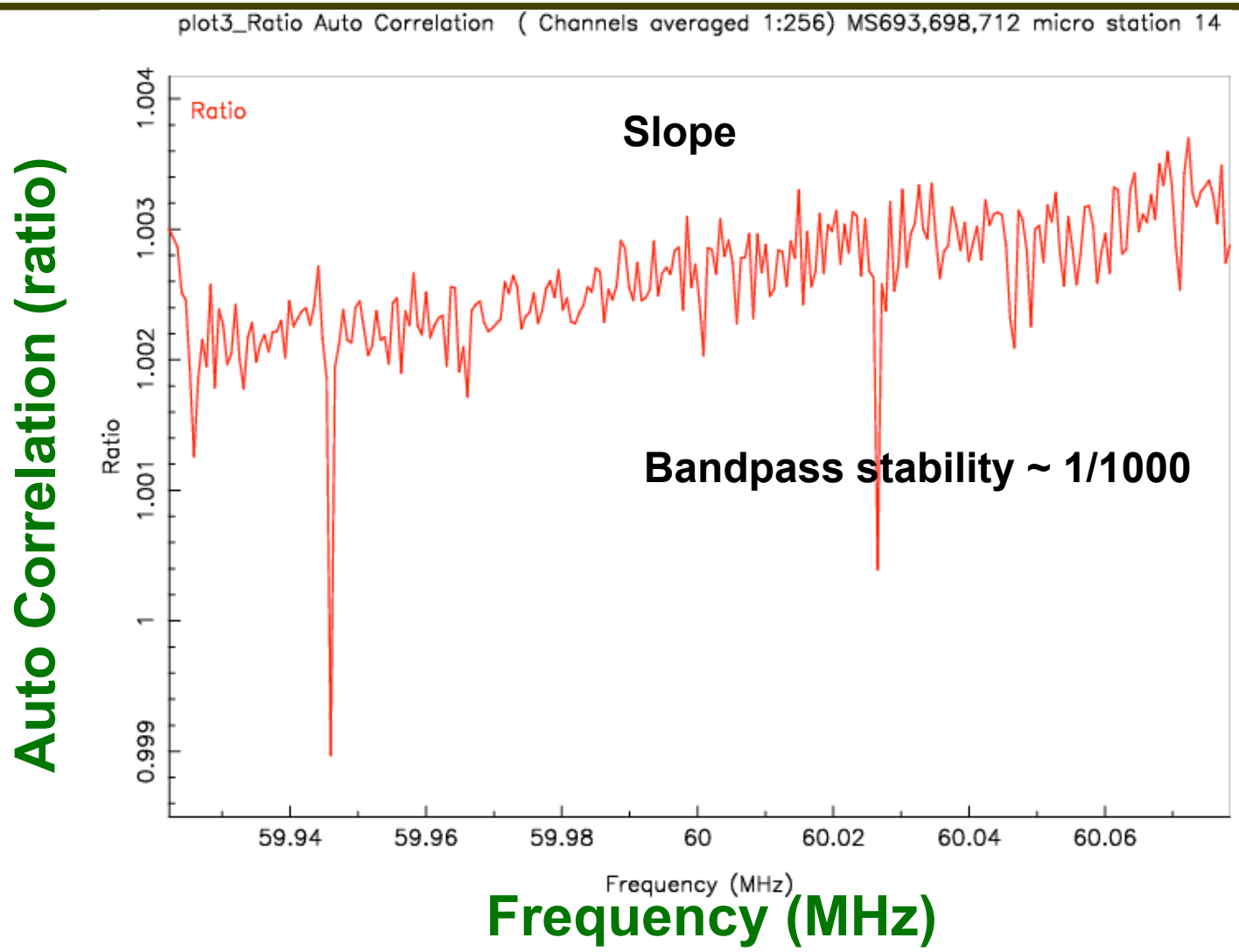
Bandpass stability - R MStn 12 MS698/MS693



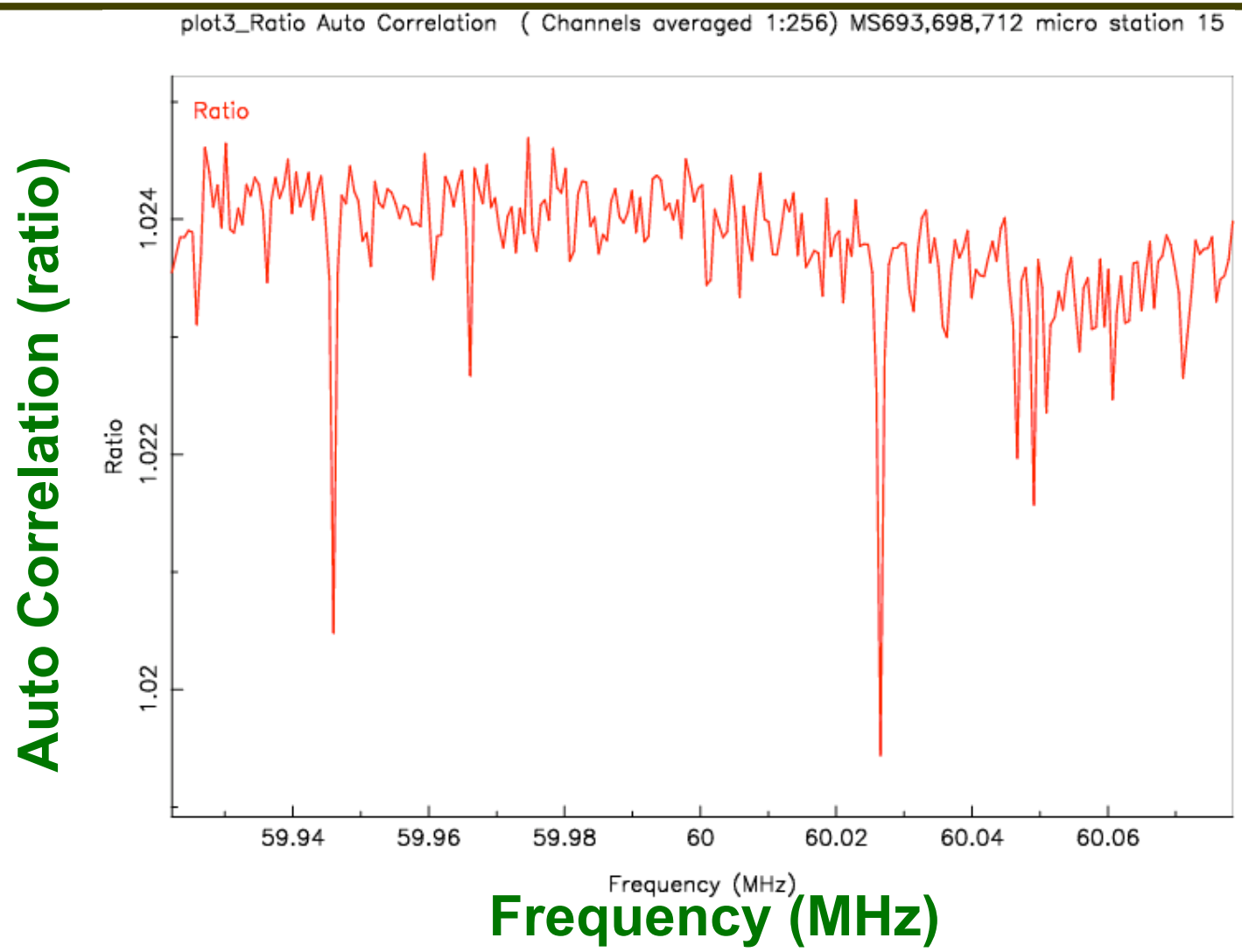
Bandpass stability - R MStn 13-MS698/MS693



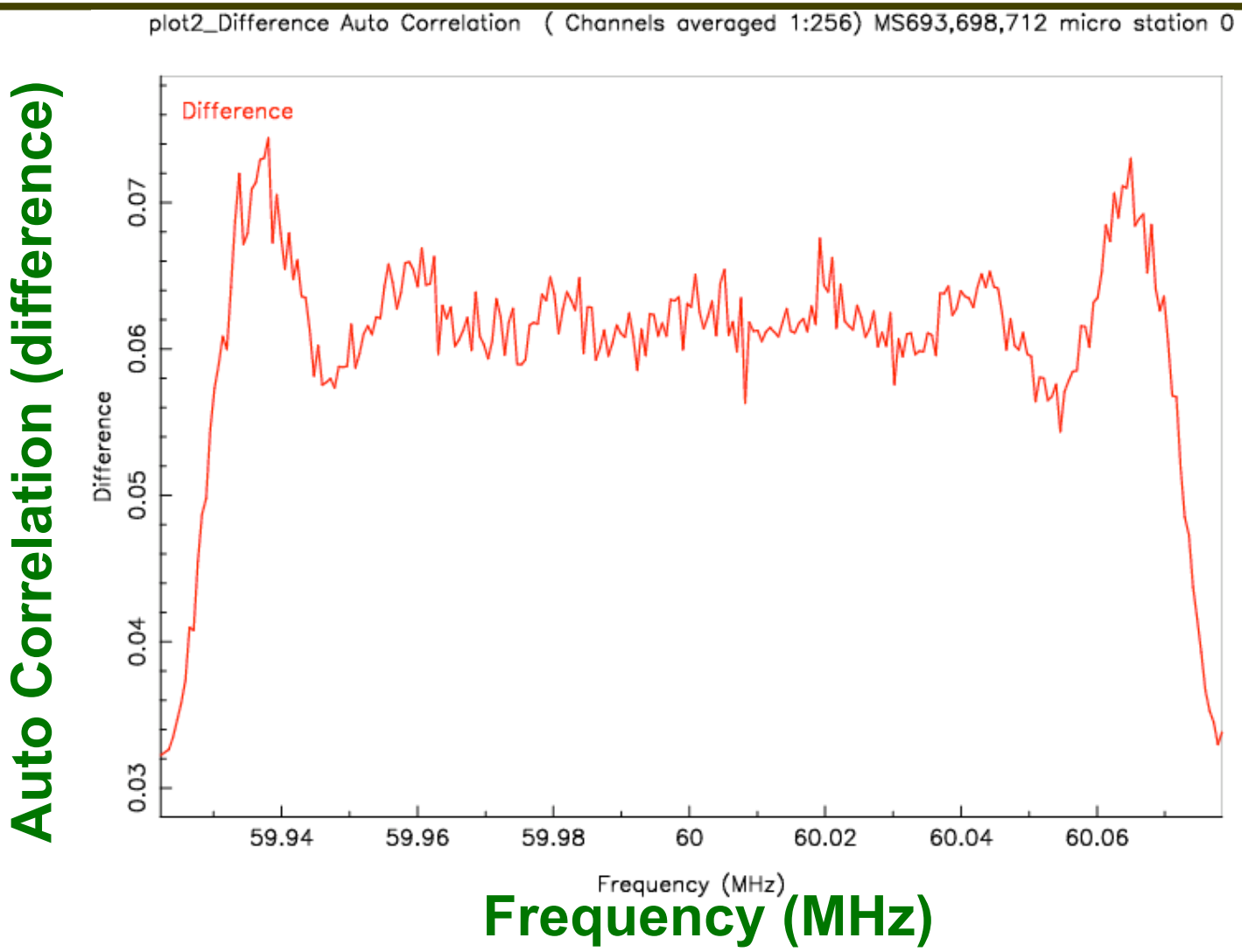
Bandpass stability - R MStn 14 MS698/MS693



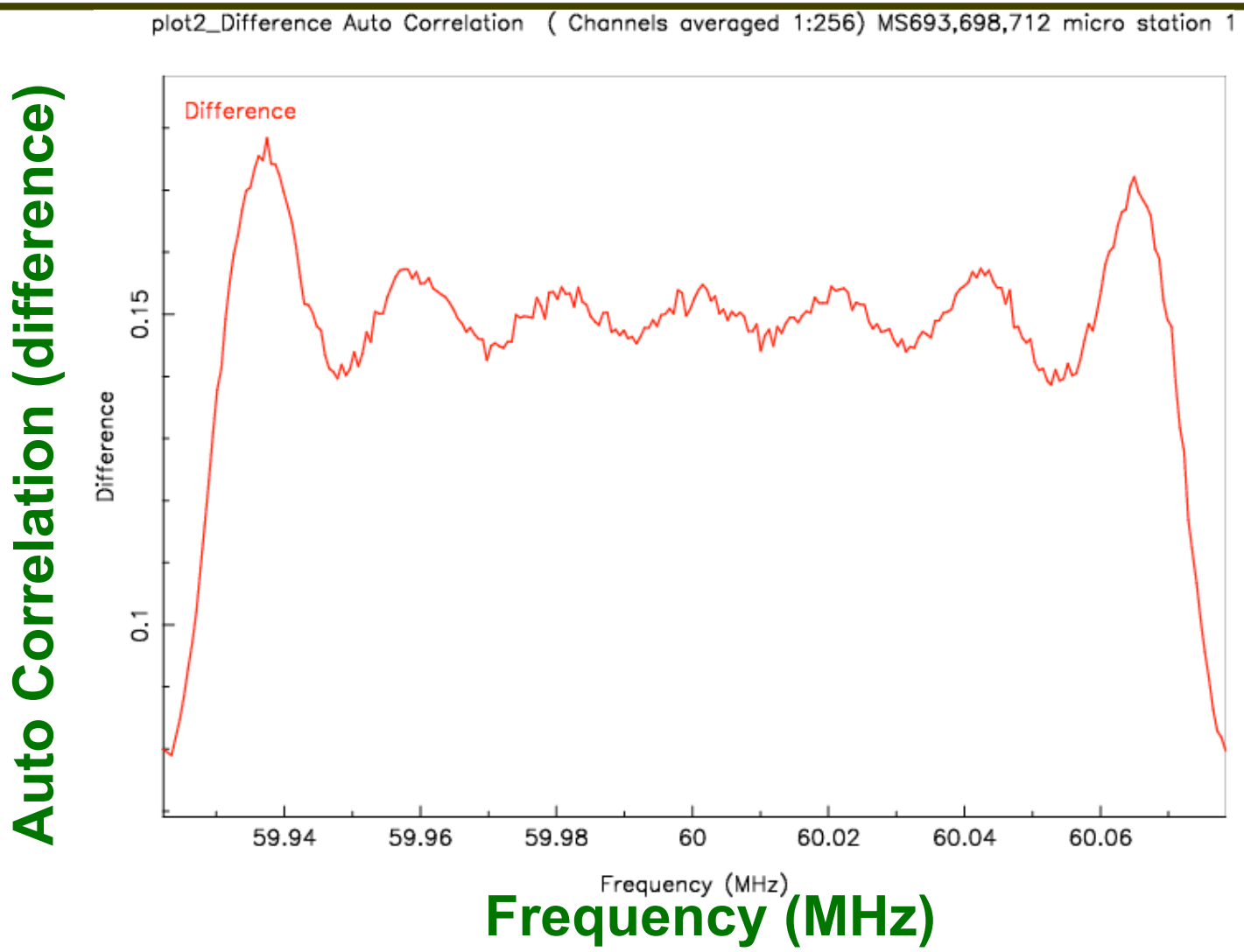
Bandpass stability - R MStn 15 MS698/MS693



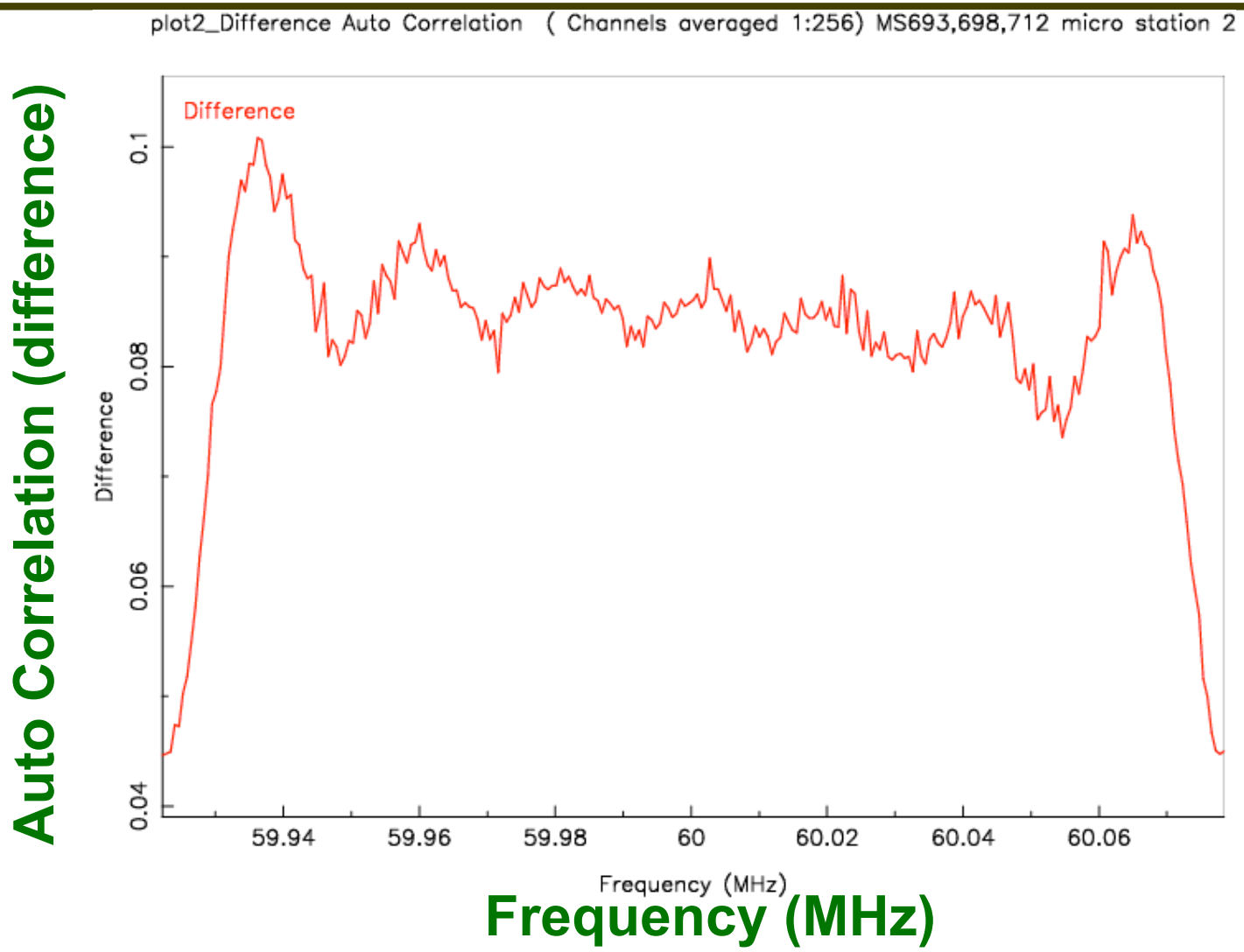
Bandpass stability - D MStn 0 - MS698/MS693



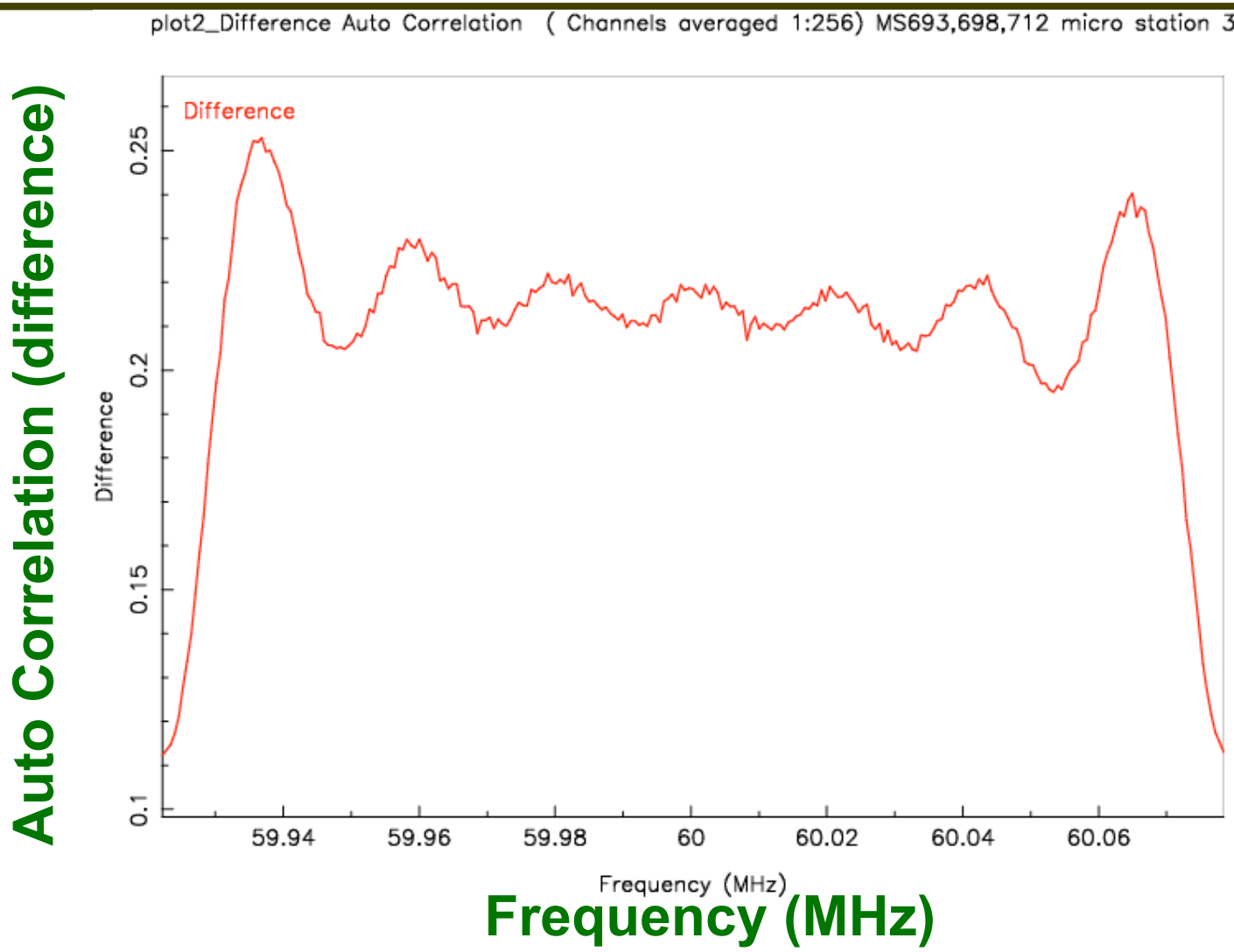
Bandpass stability - D MStn 1 - MS698/MS693



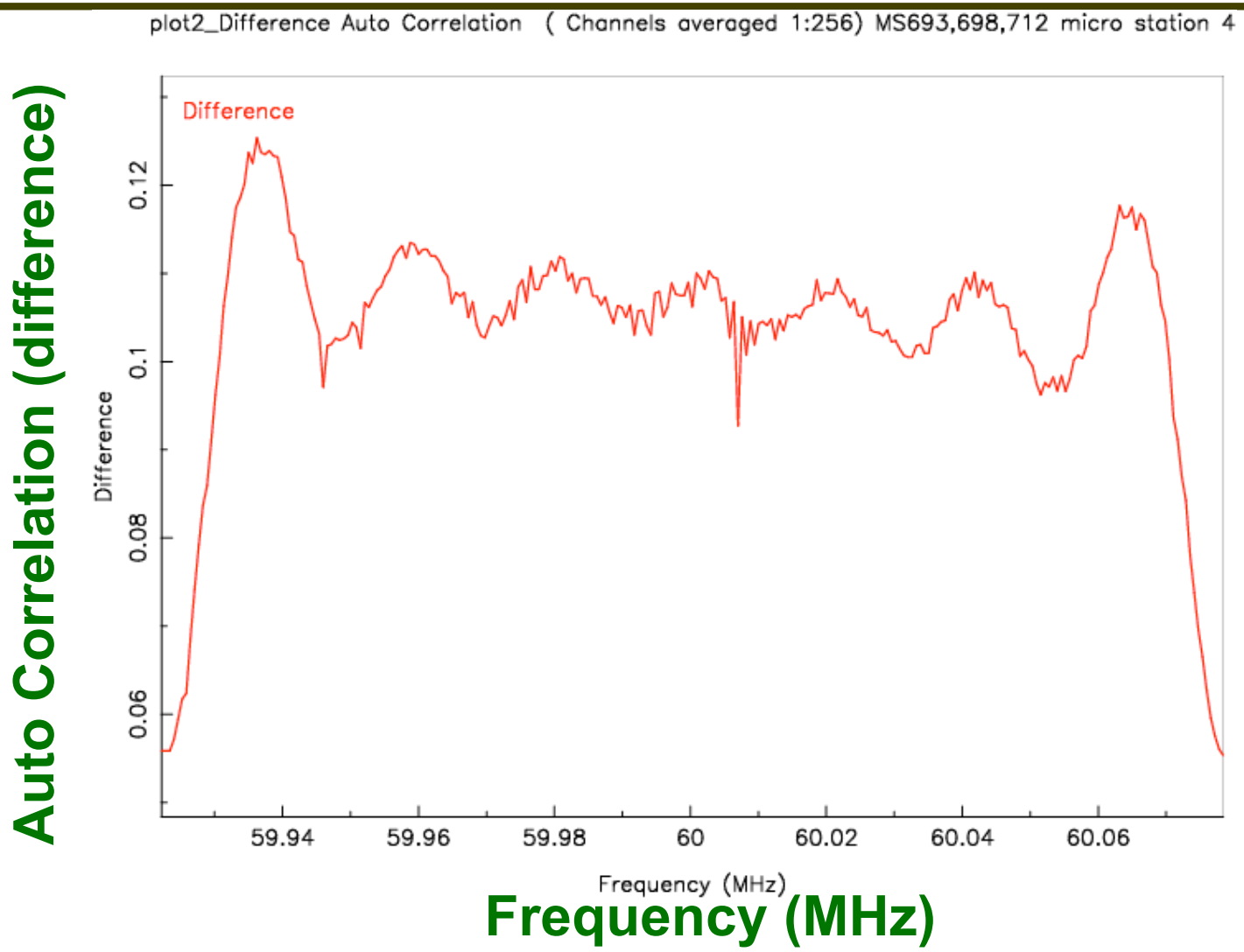
Bandpass stability - D MStn 2 - MS698/MS693



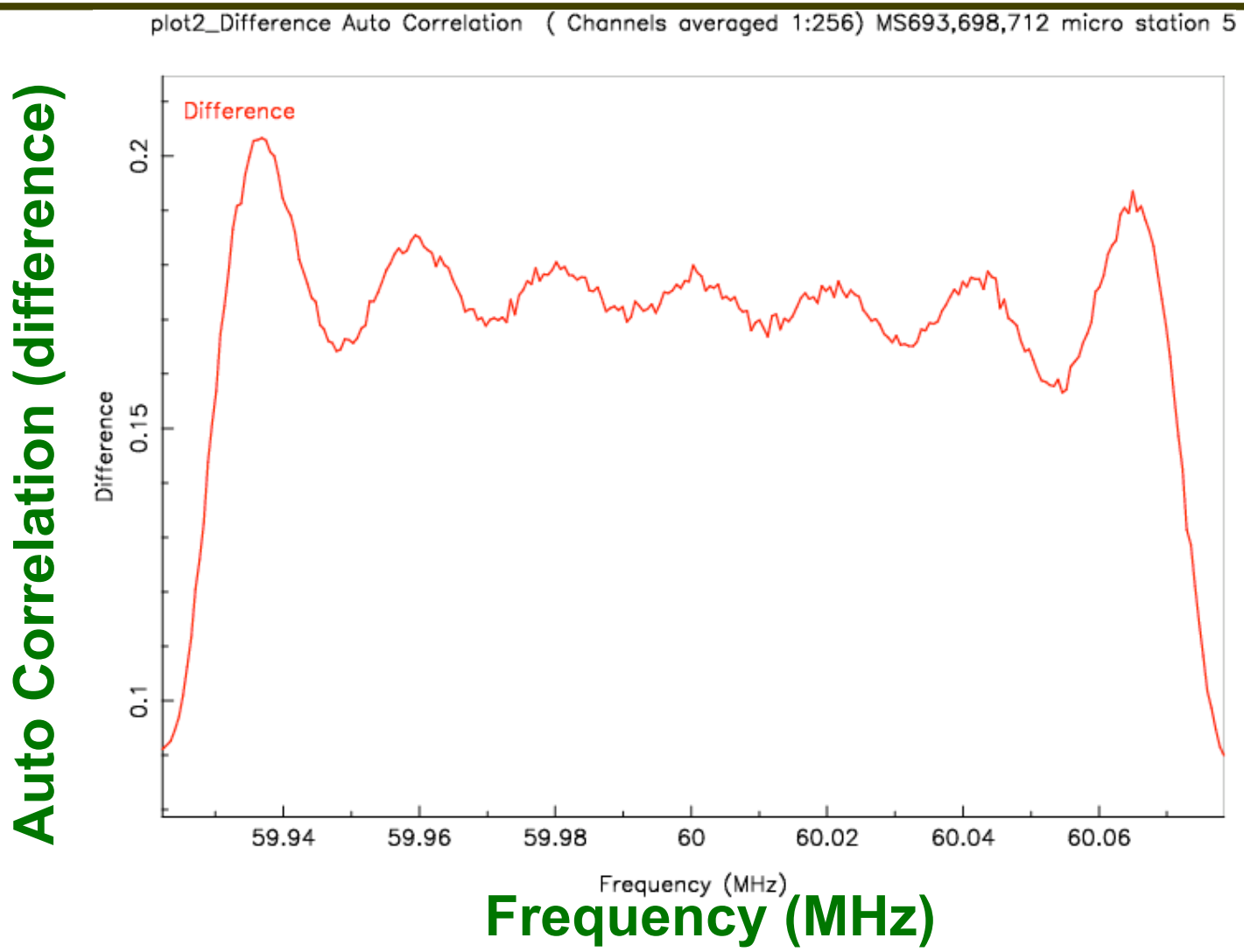
Bandpass stability - D MStn 3 - MS698/MS693



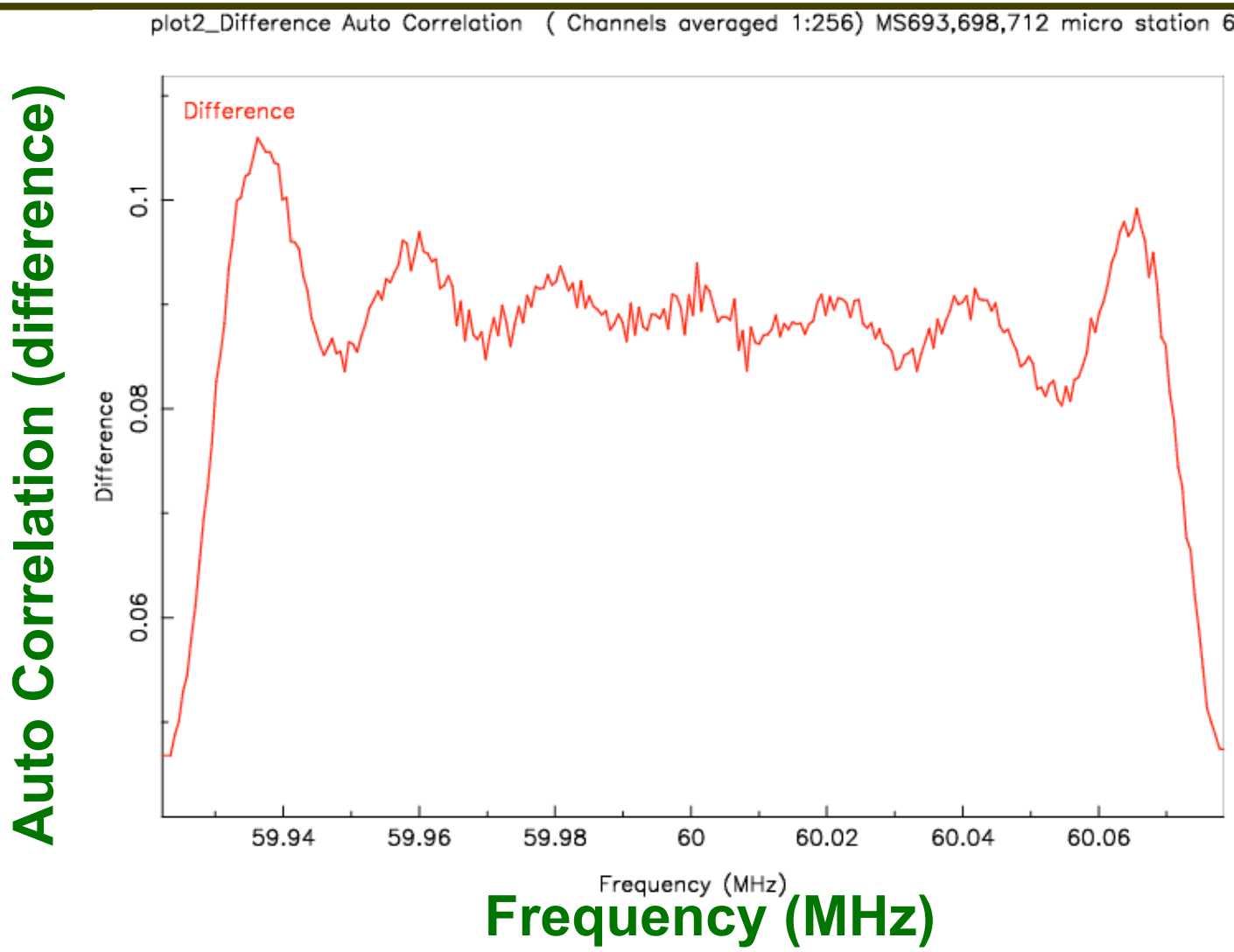
Bandpass stability - D MStn 4 - MS698/MS693



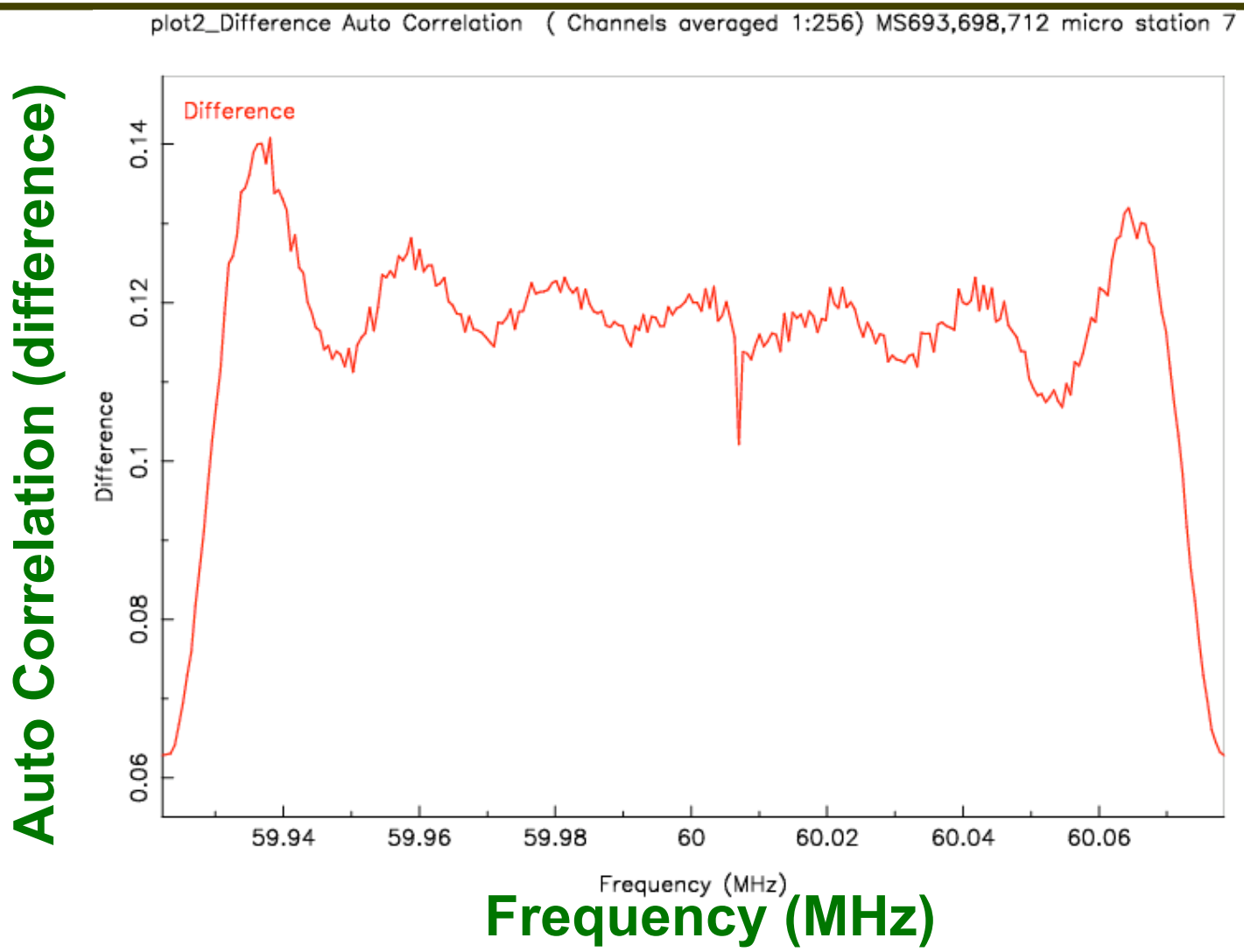
Bandpass stability - D MStn 5 - MS698/MS693



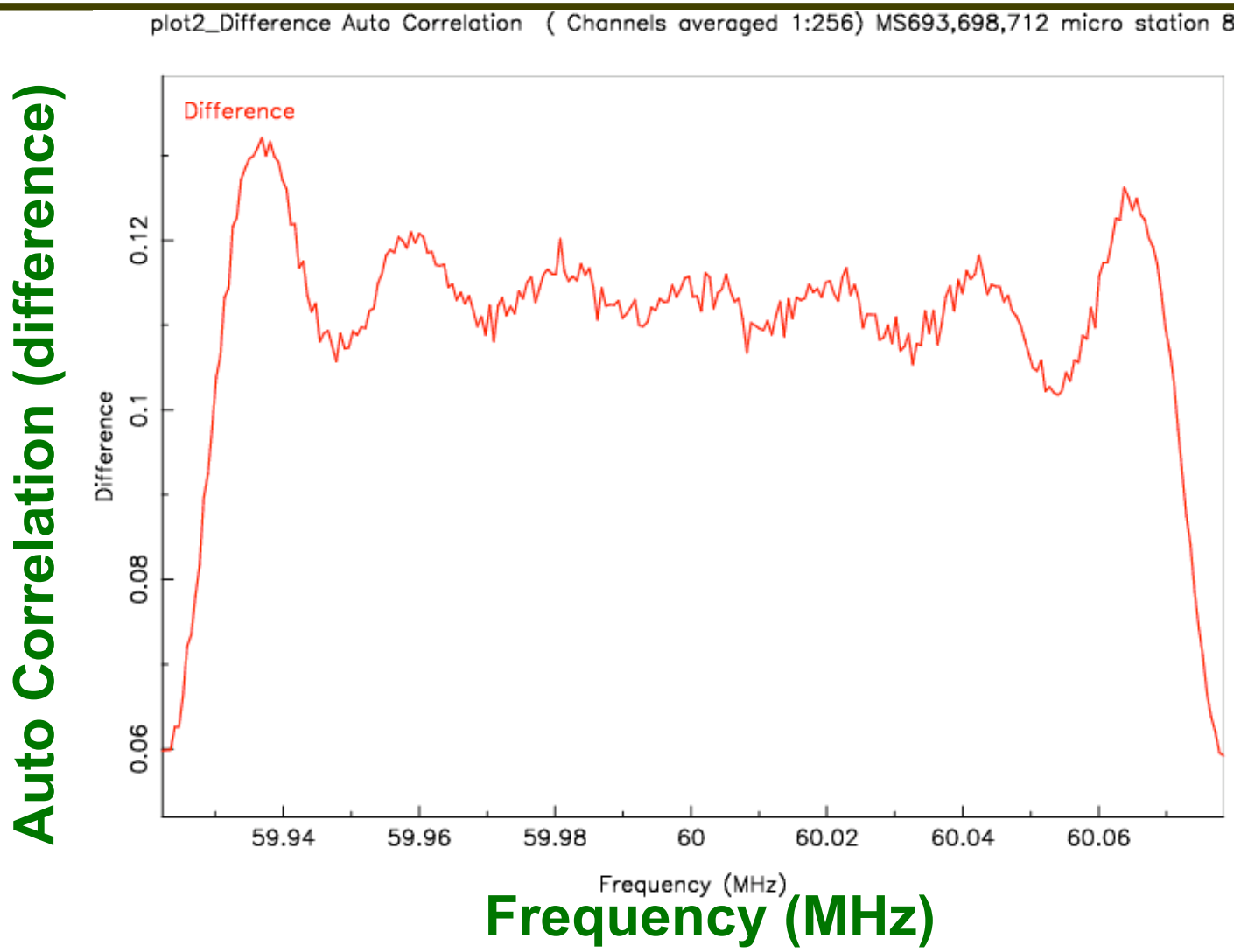
Bandpass stability - D MStn 6 - MS698/MS693



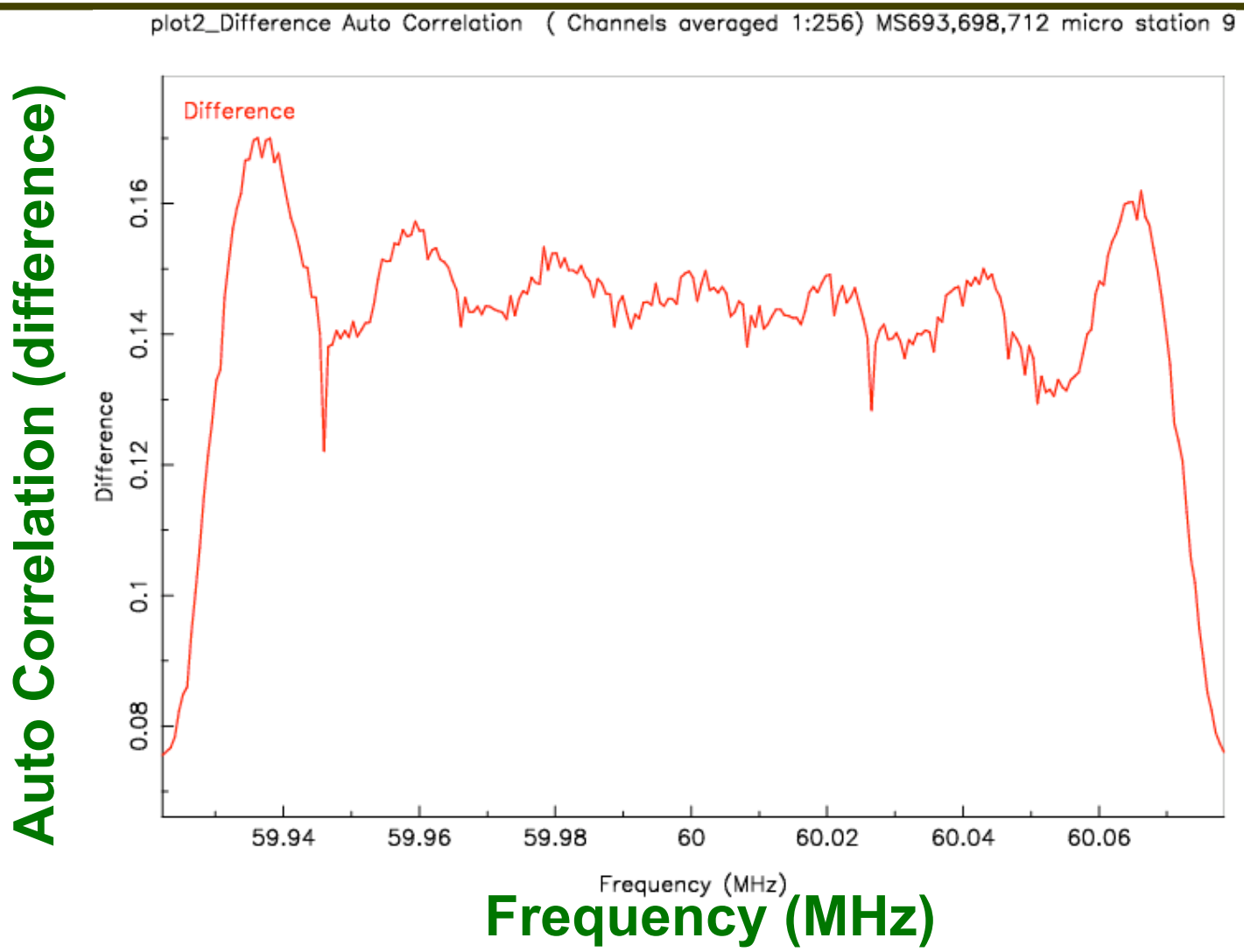
Bandpass stability - D MStn 7 - MS698/MS693



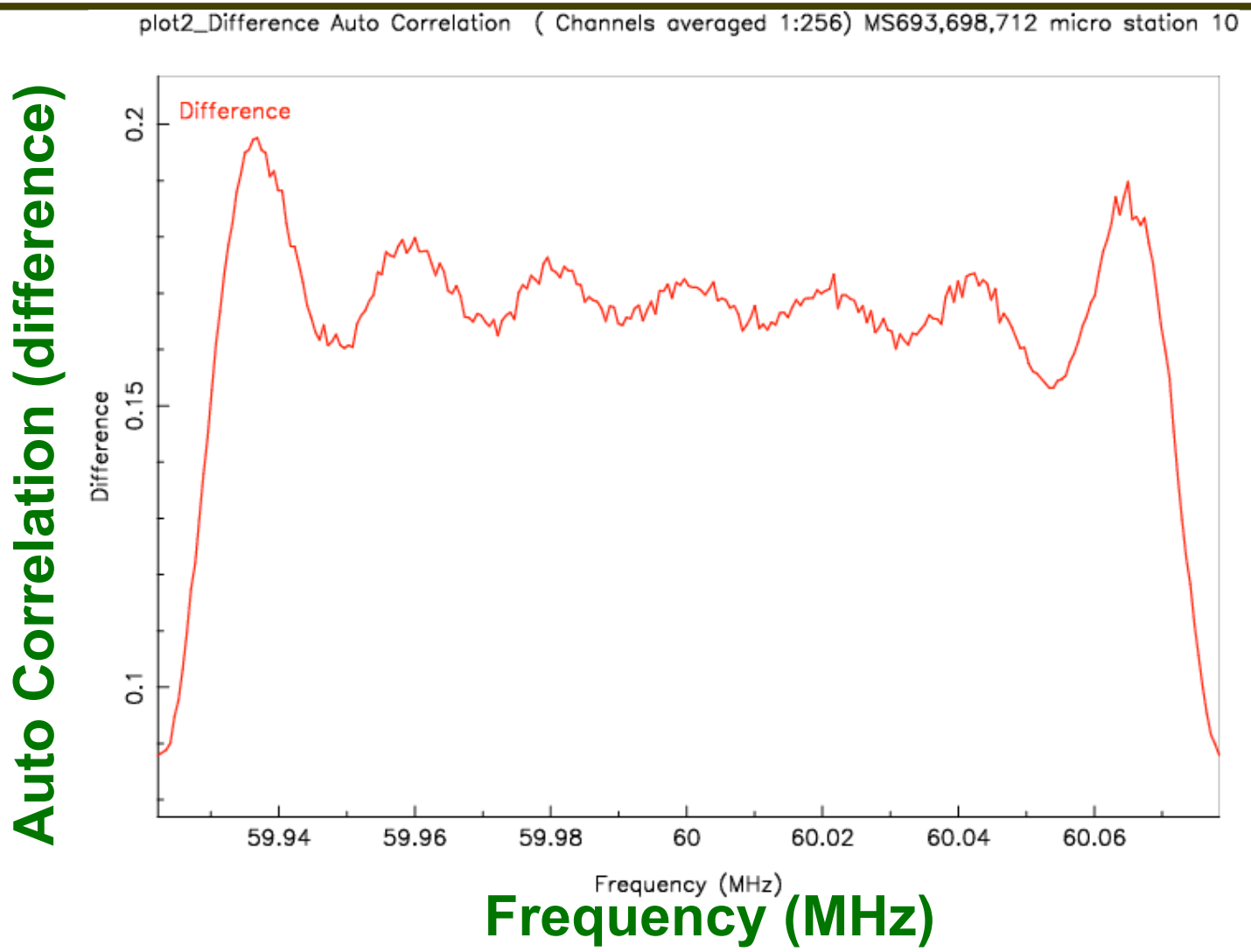
Bandpass stability - D MStn 8 - MS698/MS693



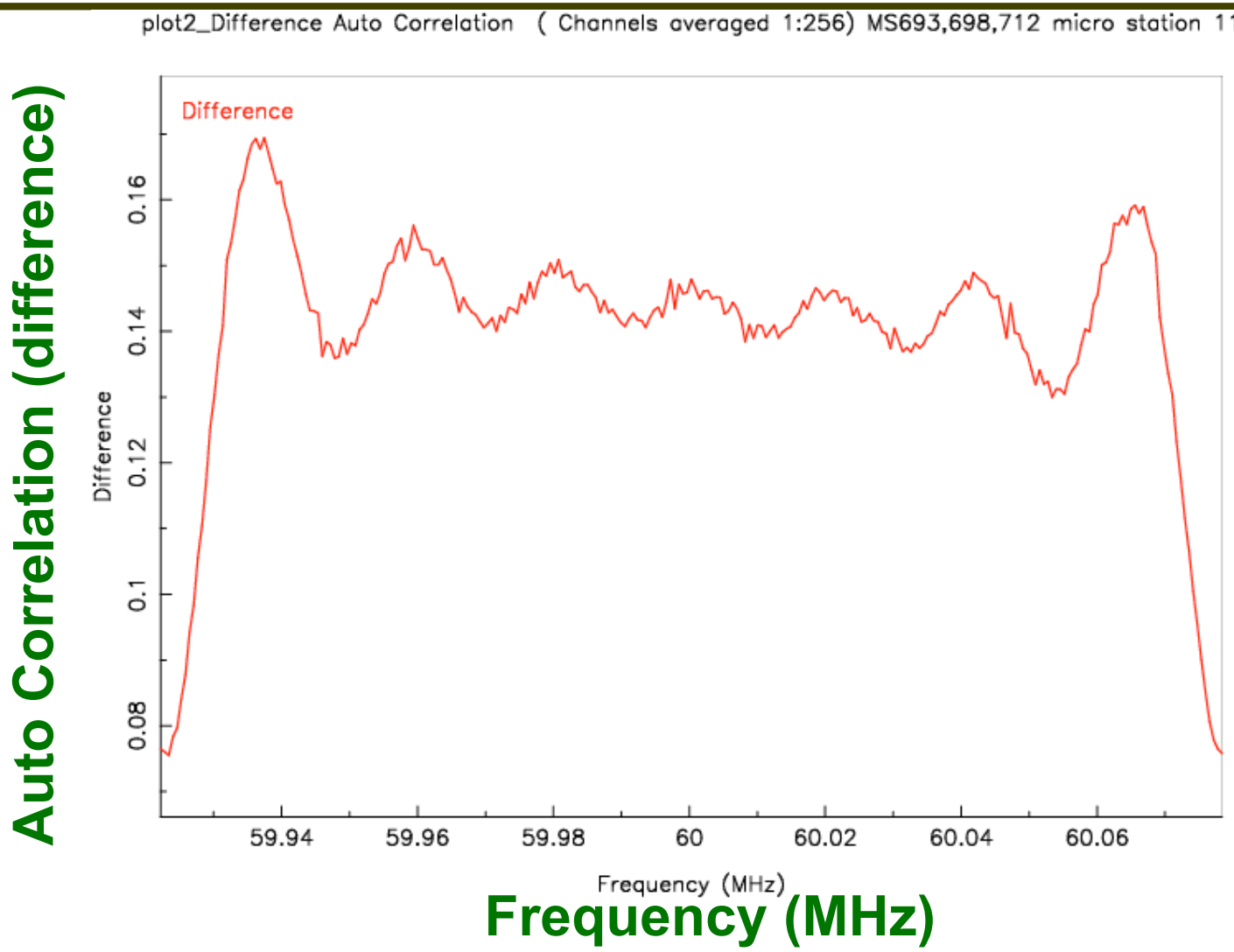
Bandpass stability - D MStn 9 - MS698/MS693



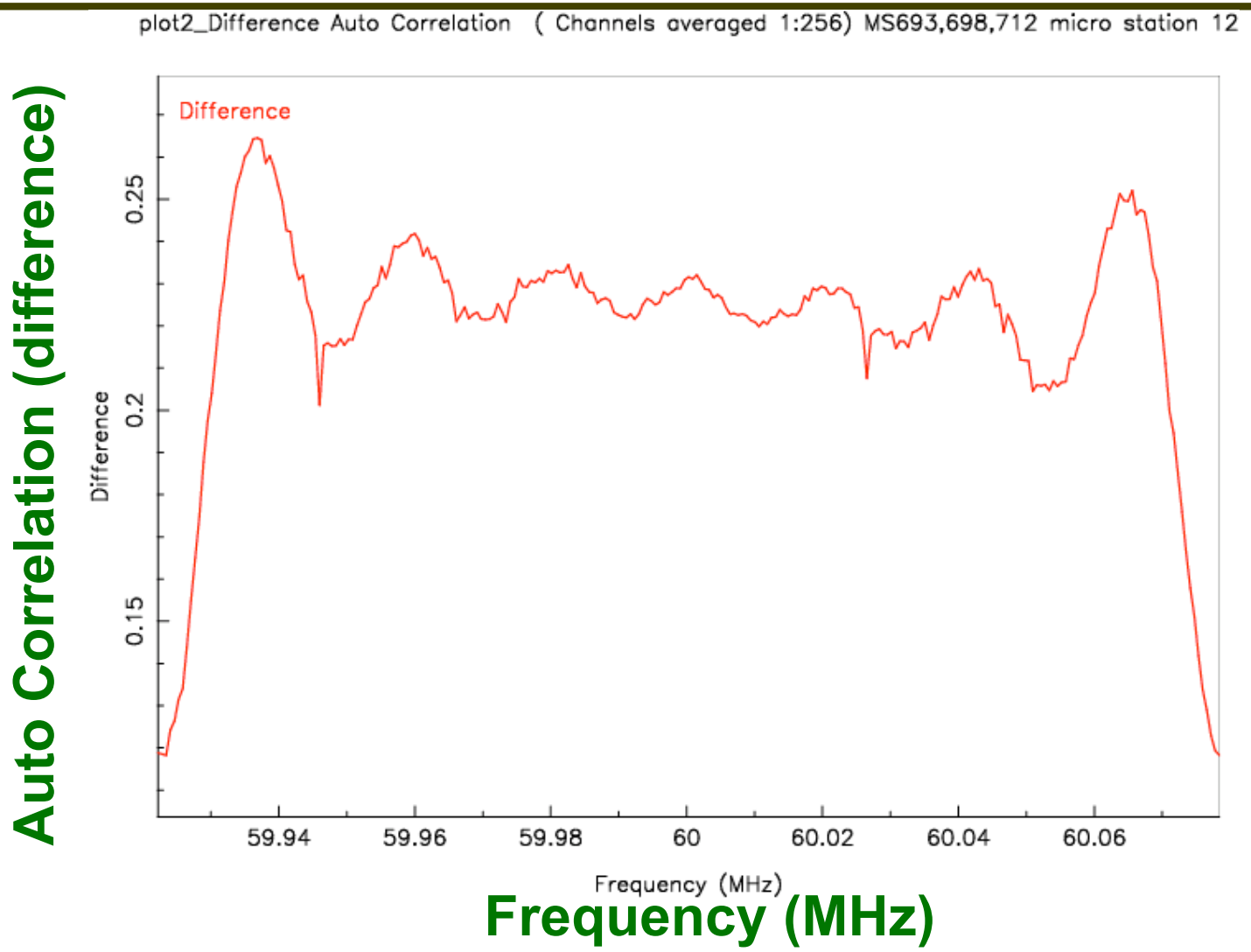
Bandpass stability - D MStn 10 MS698/MS693



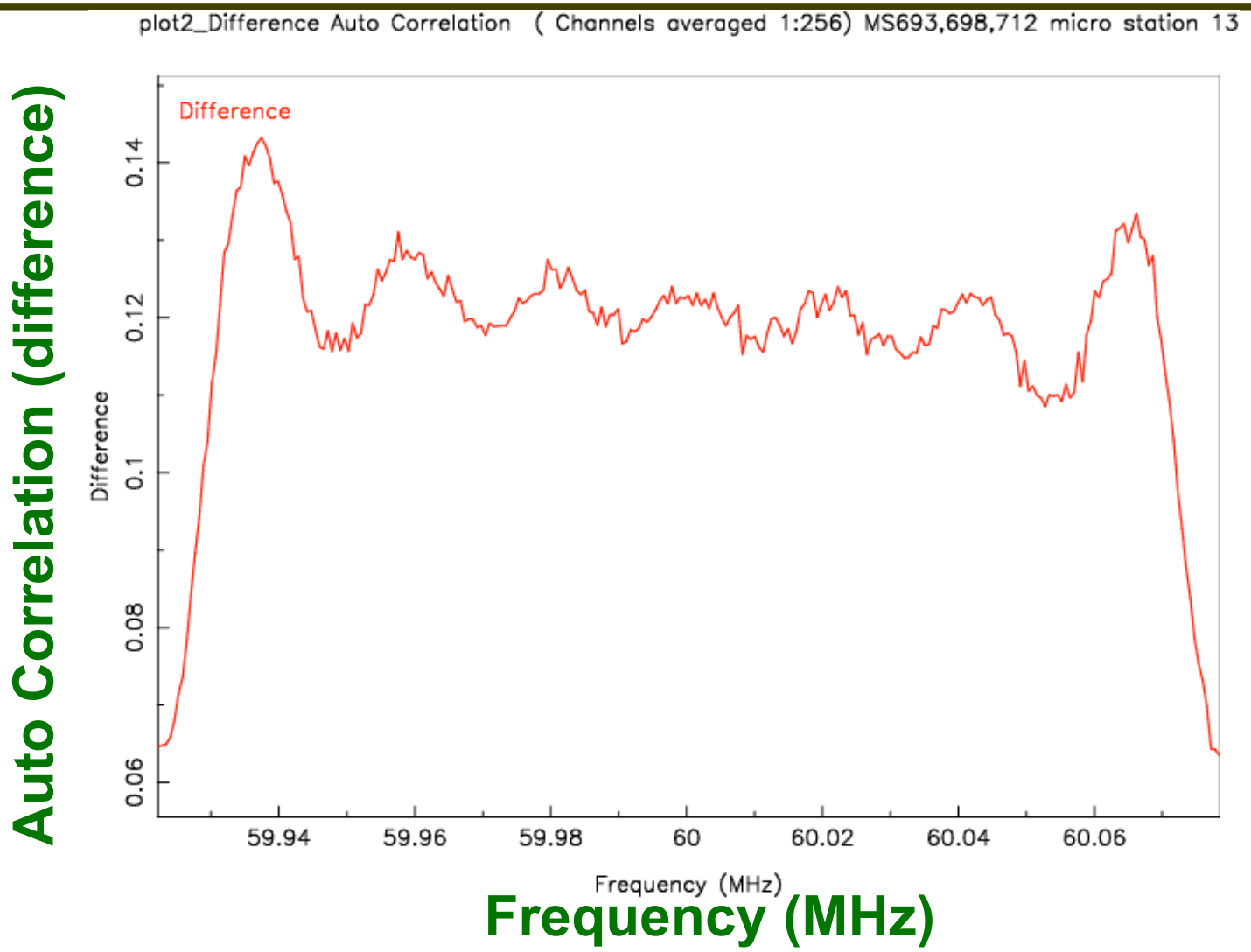
Bandpass stability - D MStn 11 MS698/MS693



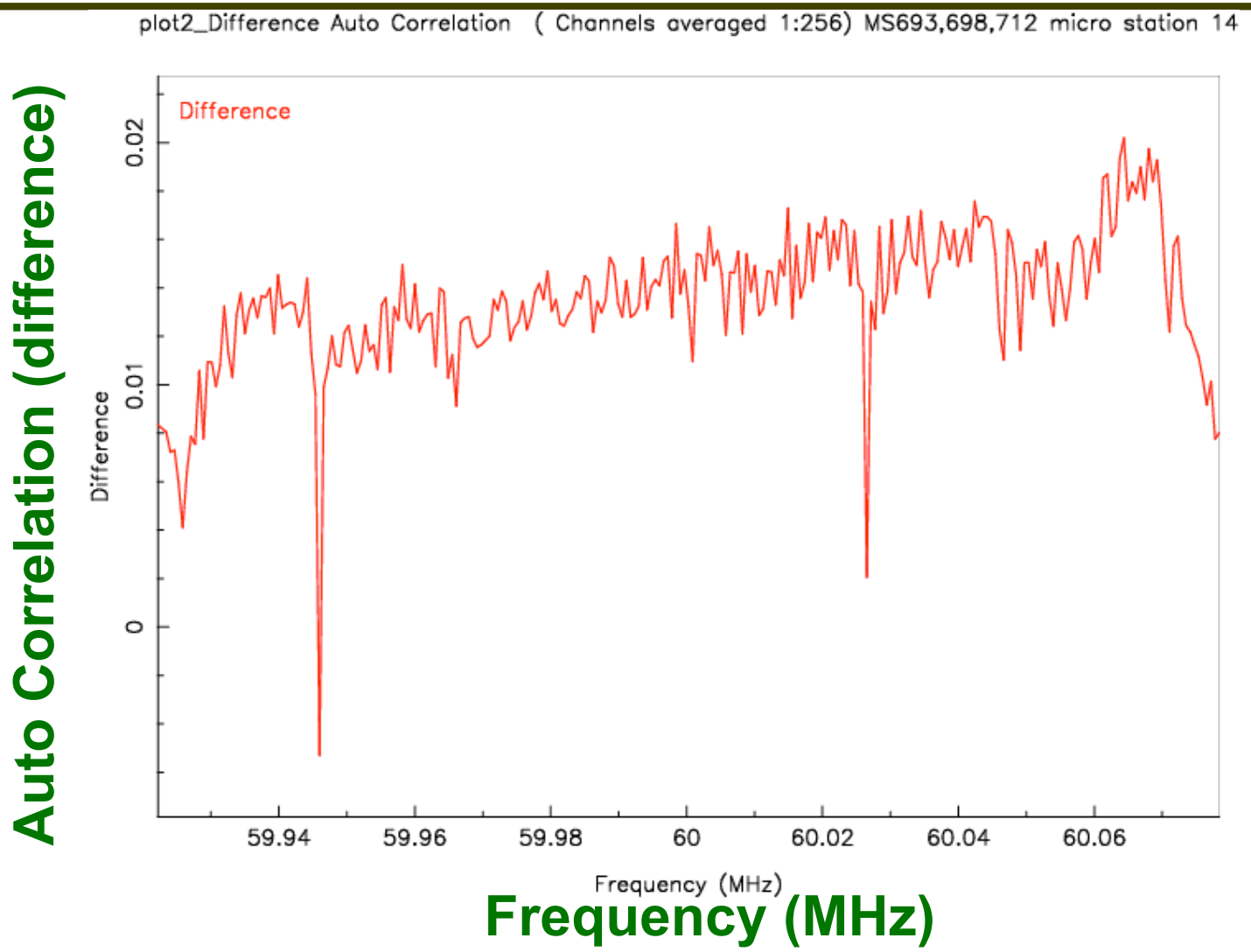
Bandpass stability - D MStn 12-MS698/MS693



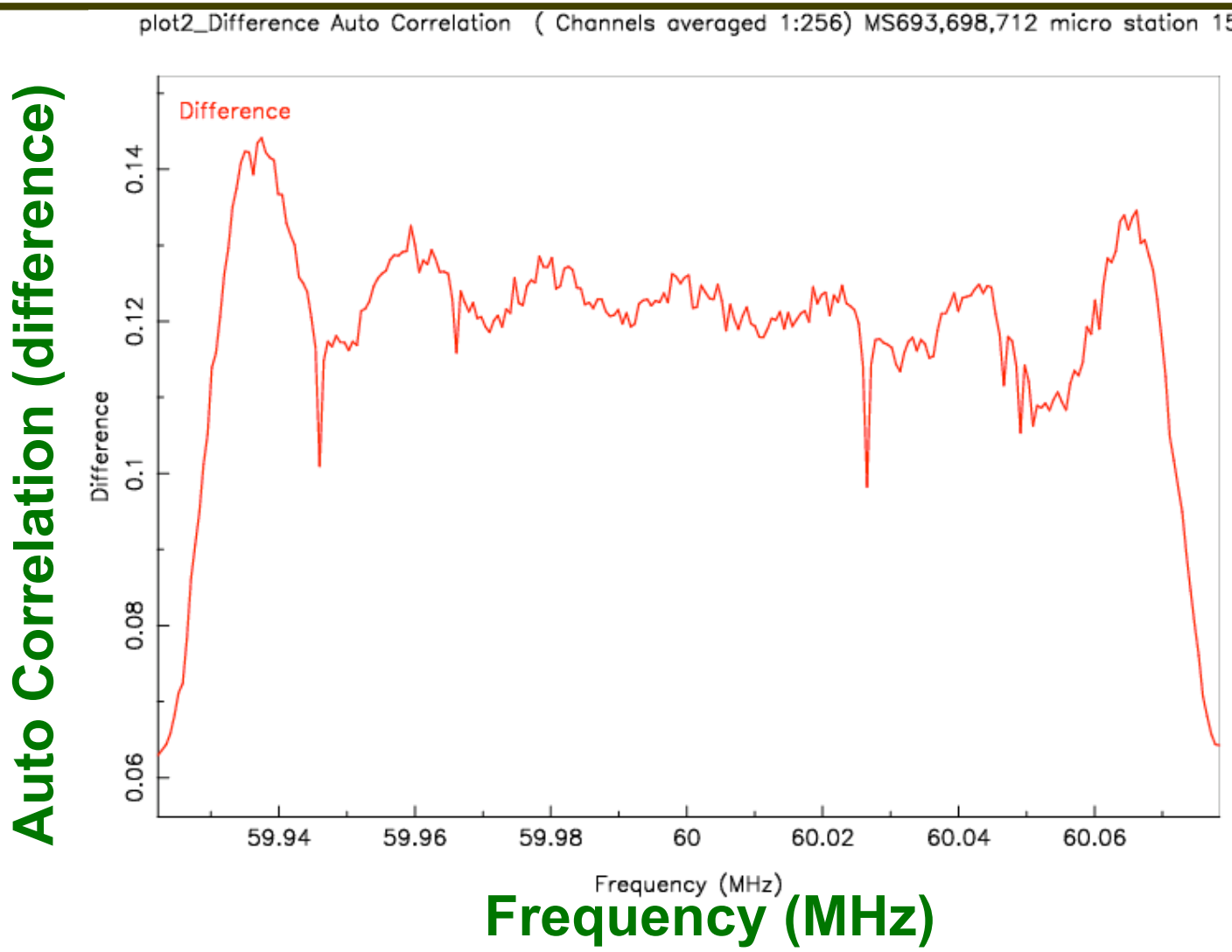
Bandpass stability - D MStn 13-MS698/MS693



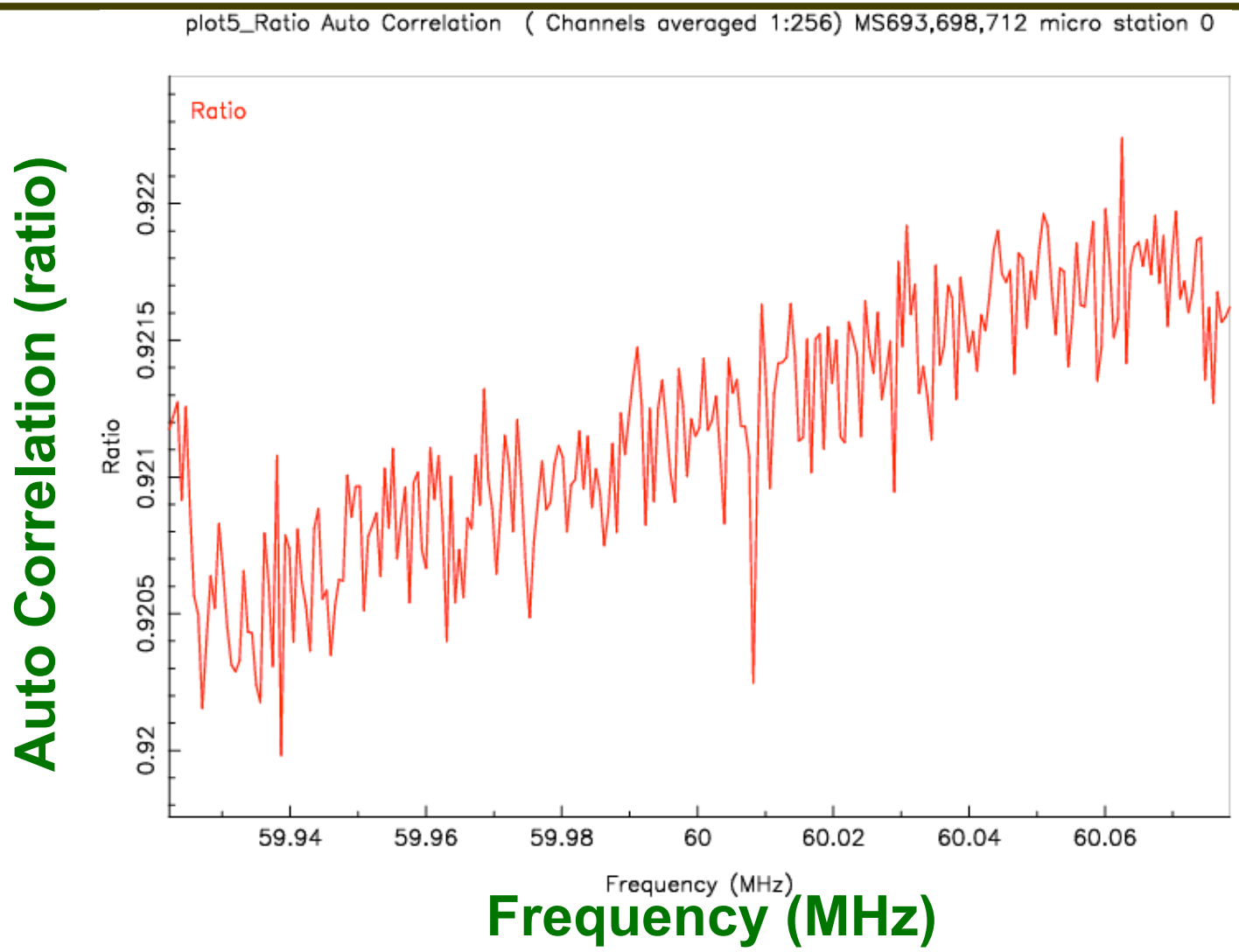
Bandpass stability - D MStn 14 - MS698/MS693



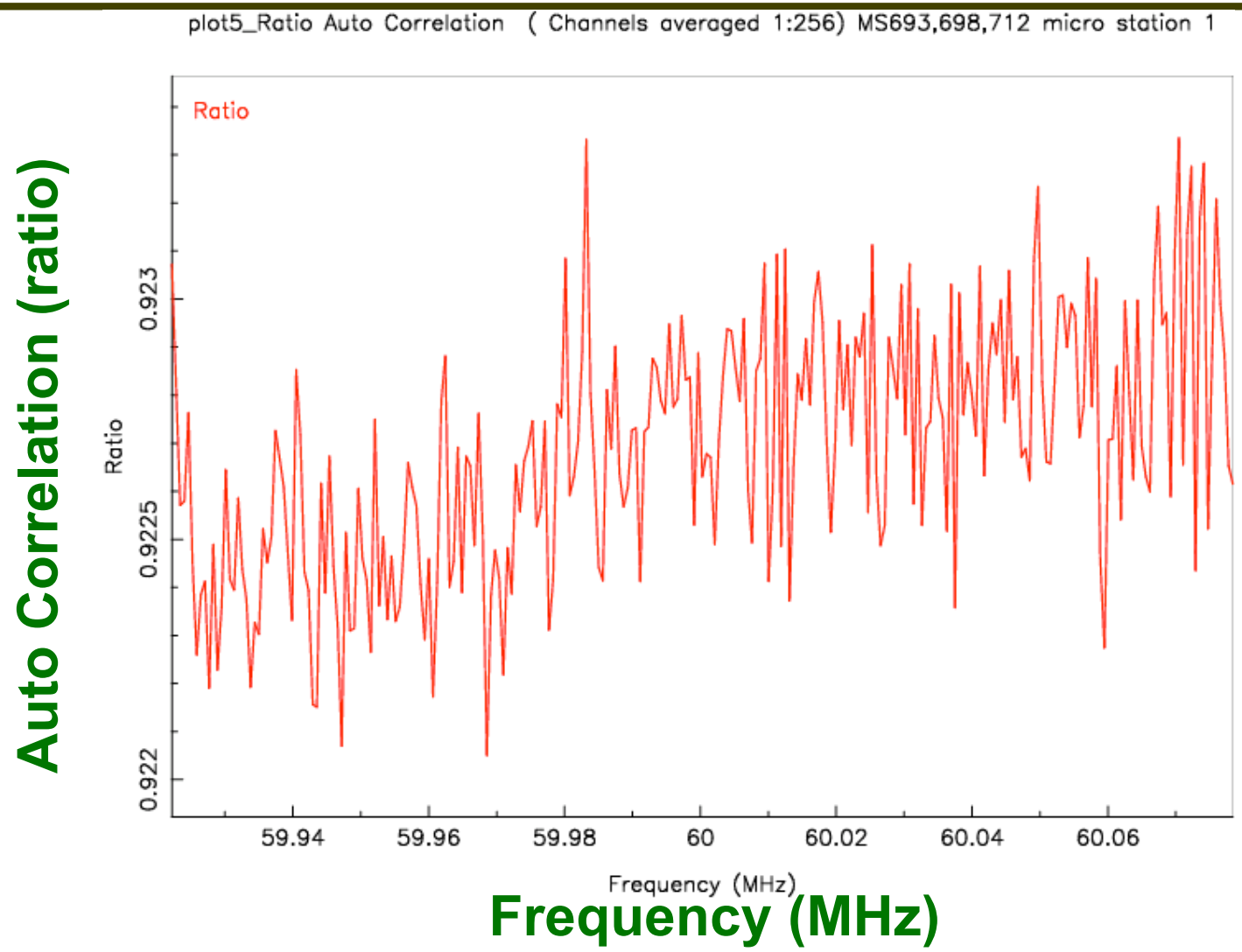
Bandpass stability - D MStn 15 MS698/MS693



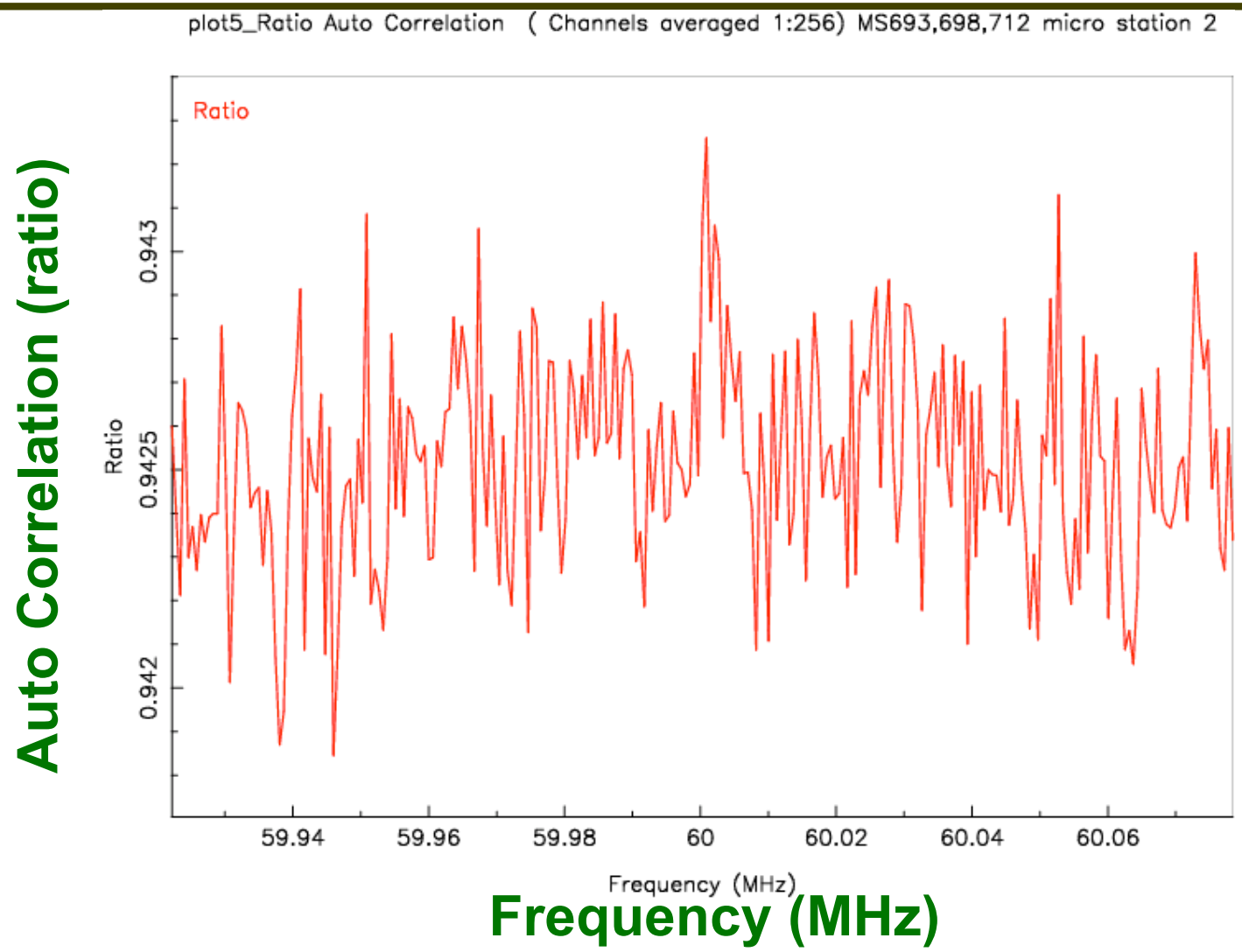
Bandpass stability - R MStn 0 - MS712/MS693



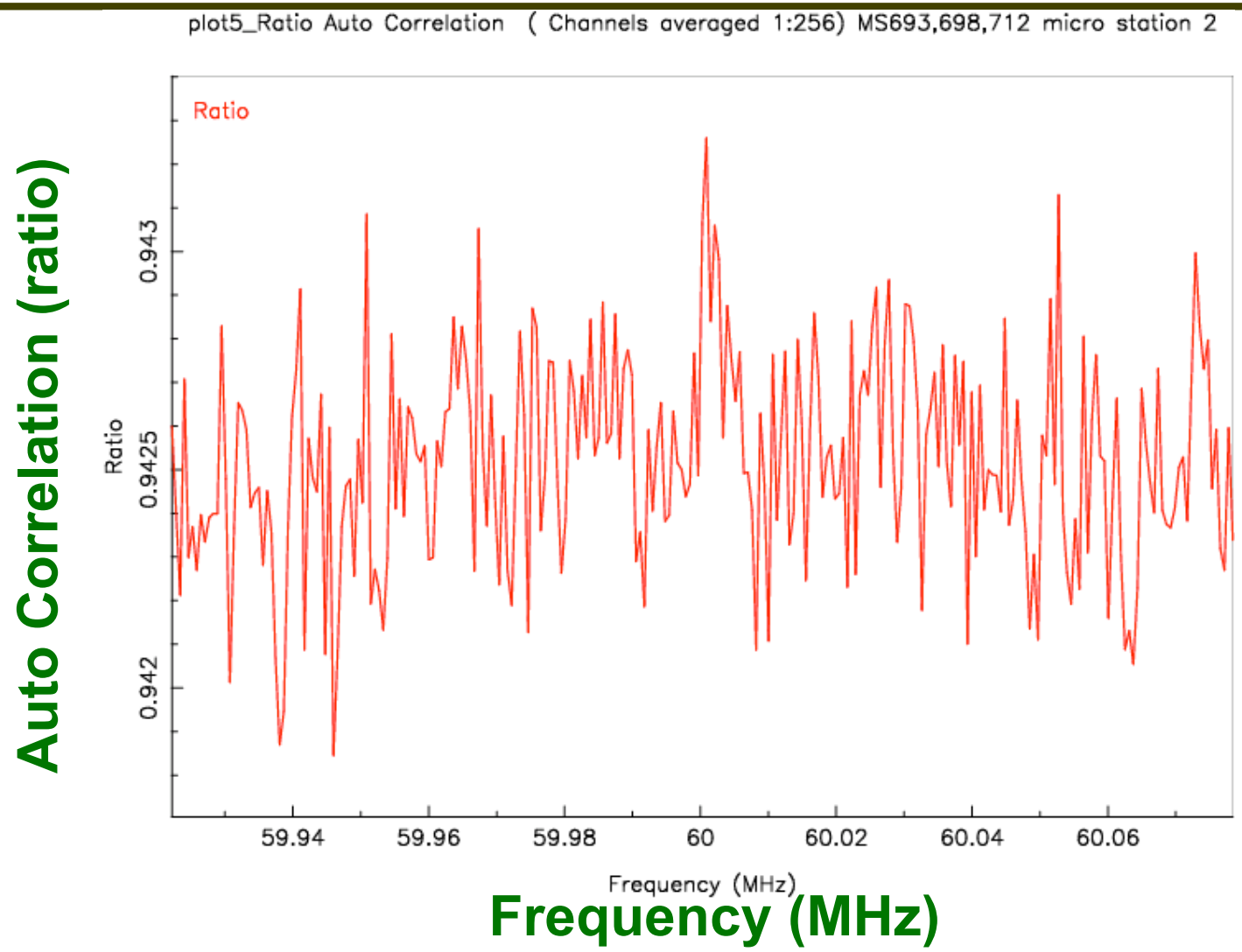
Bandpass stability - R MStn 1 - MS712/MS693



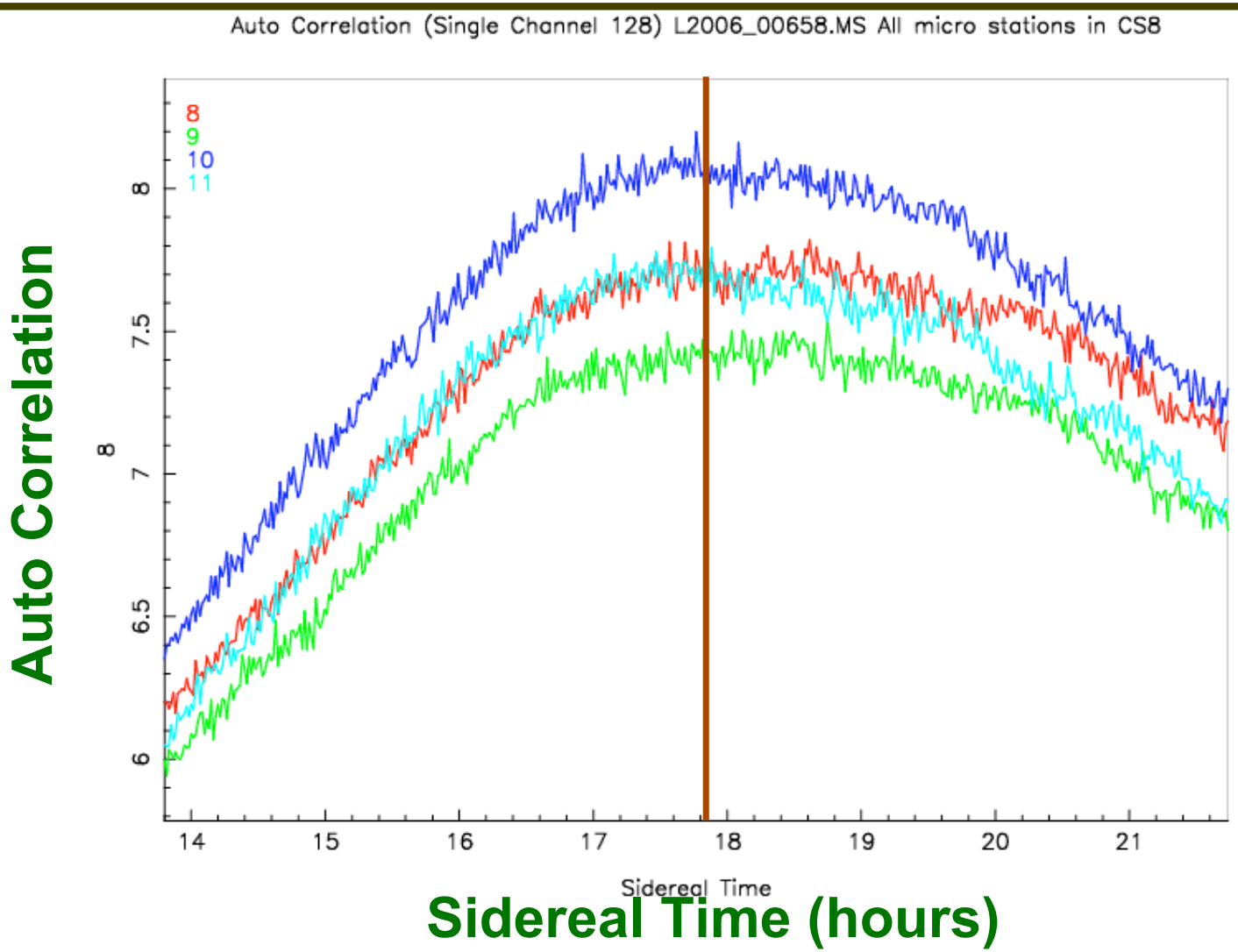
Bandpass stability - R MStn 2 - MS712/MS693



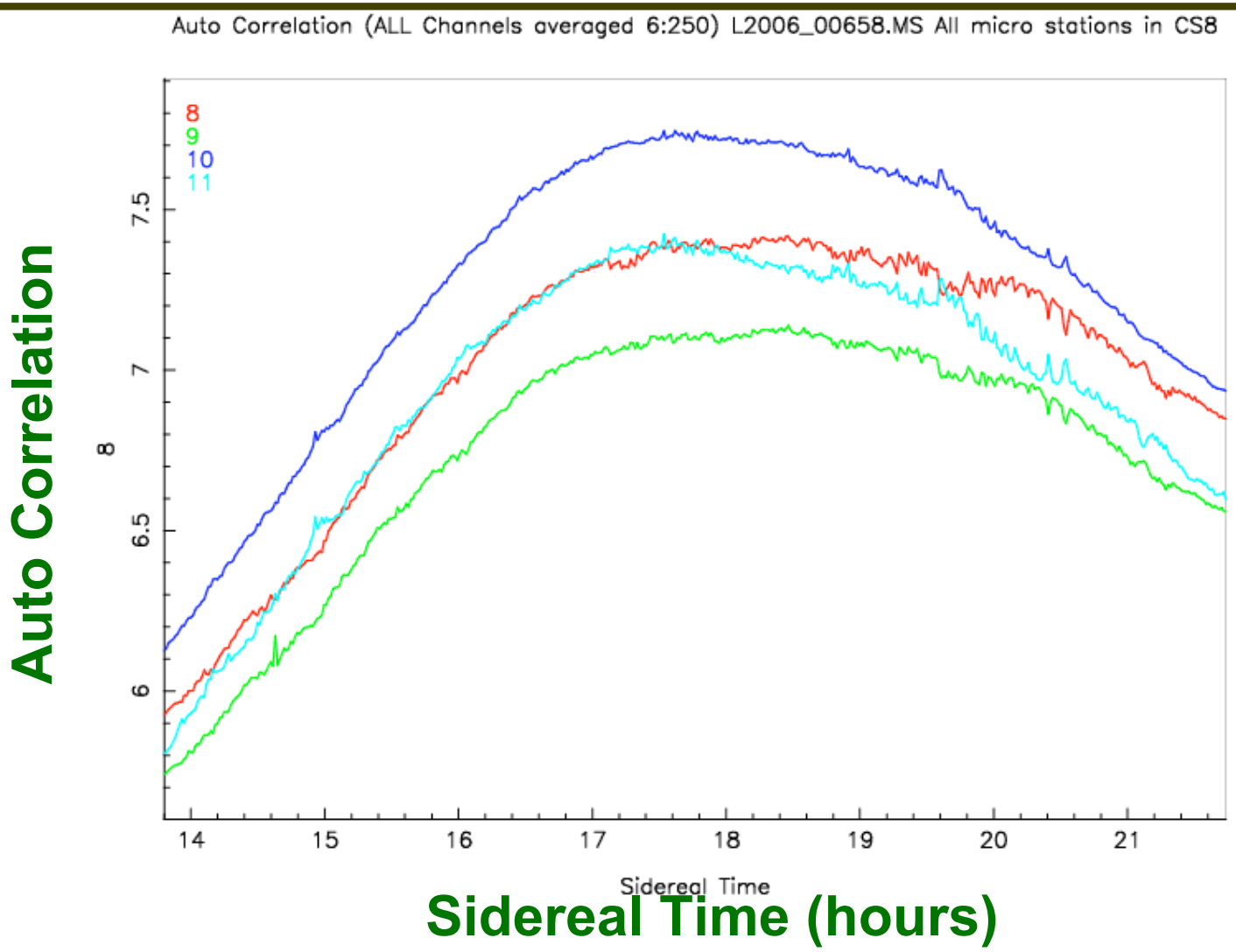
Bandpass stability - R MStn 2 - MS712/MS693



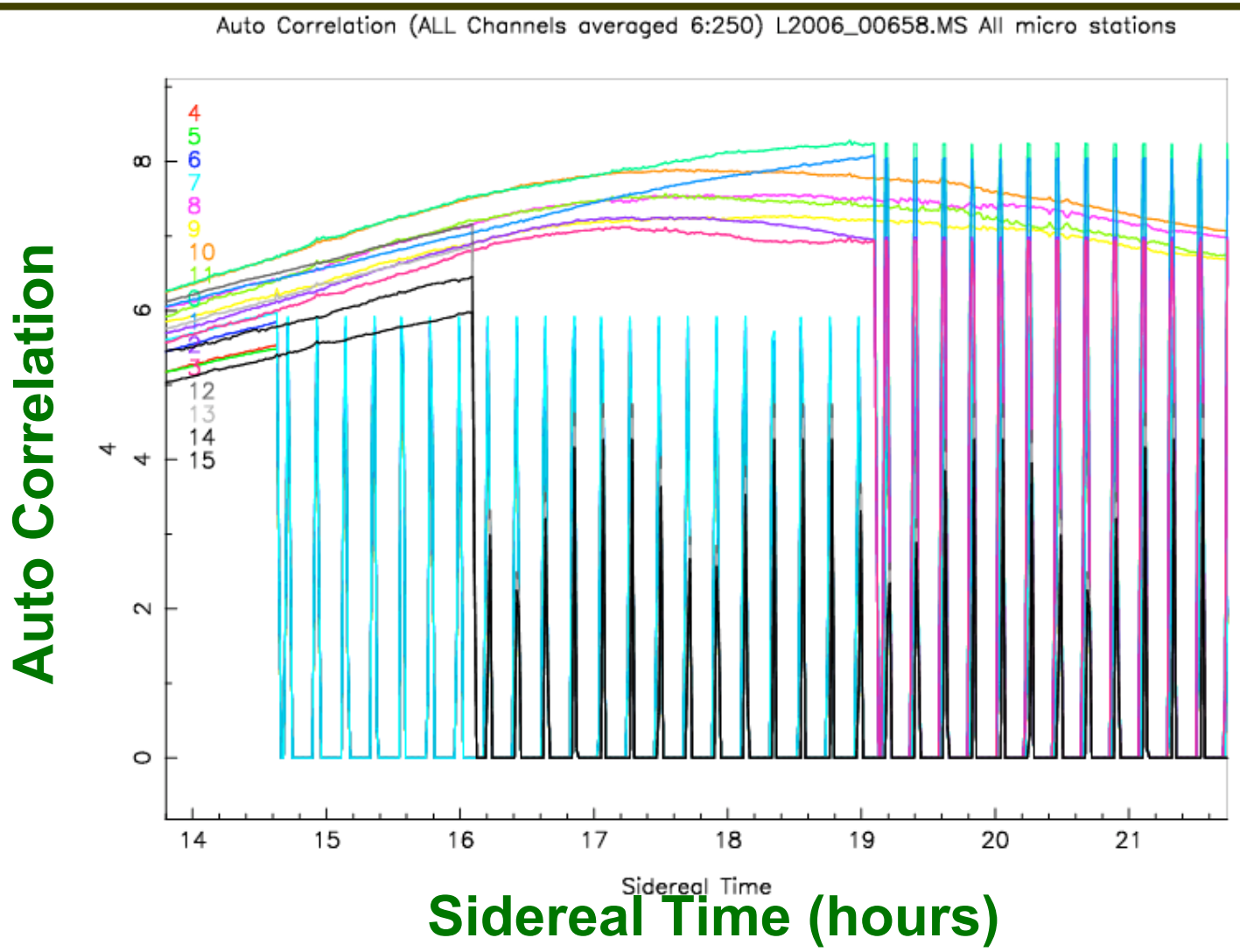
Auto correlation as time MS658



Auto correlation as time



Auto correlation as time

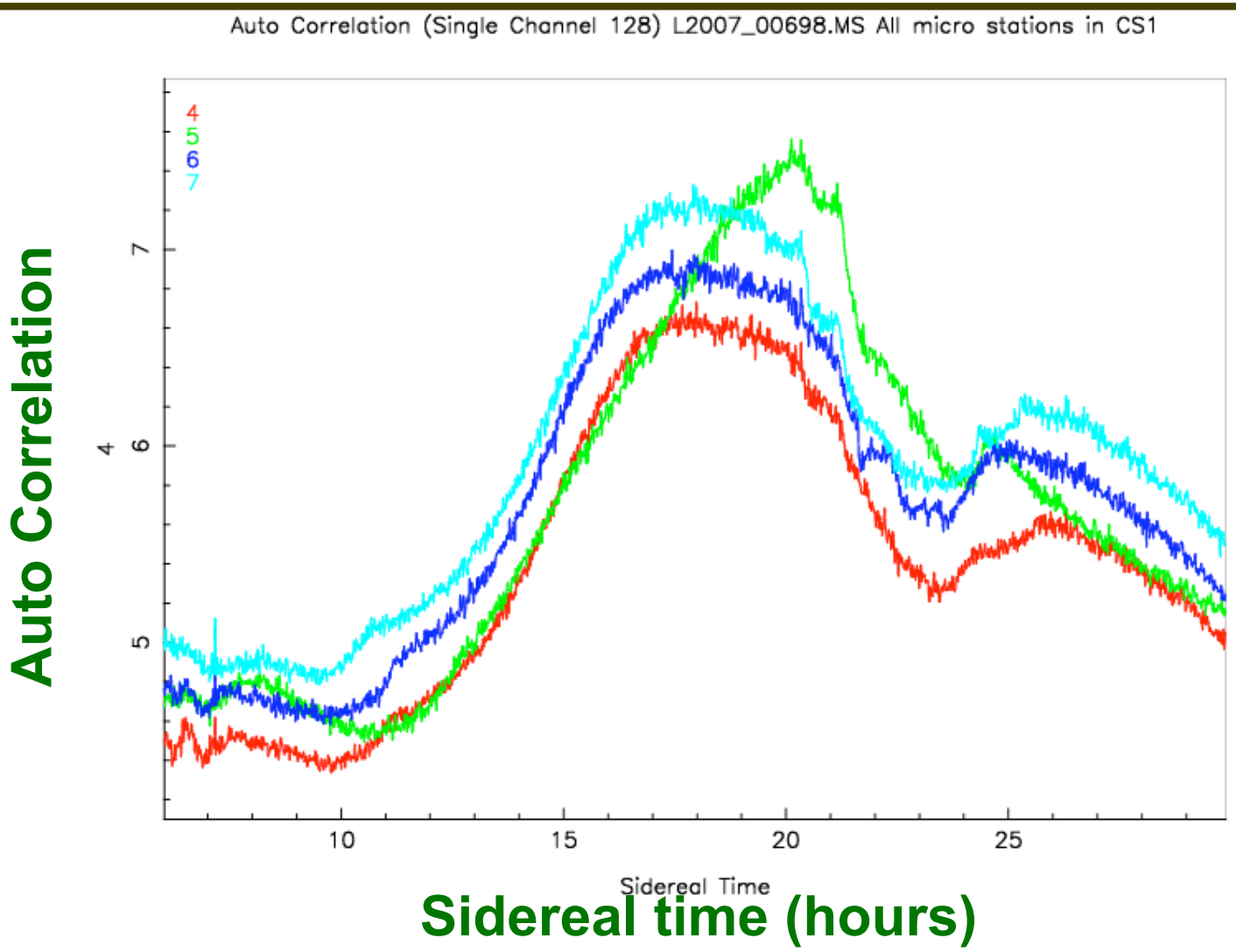


Conclusions/To do

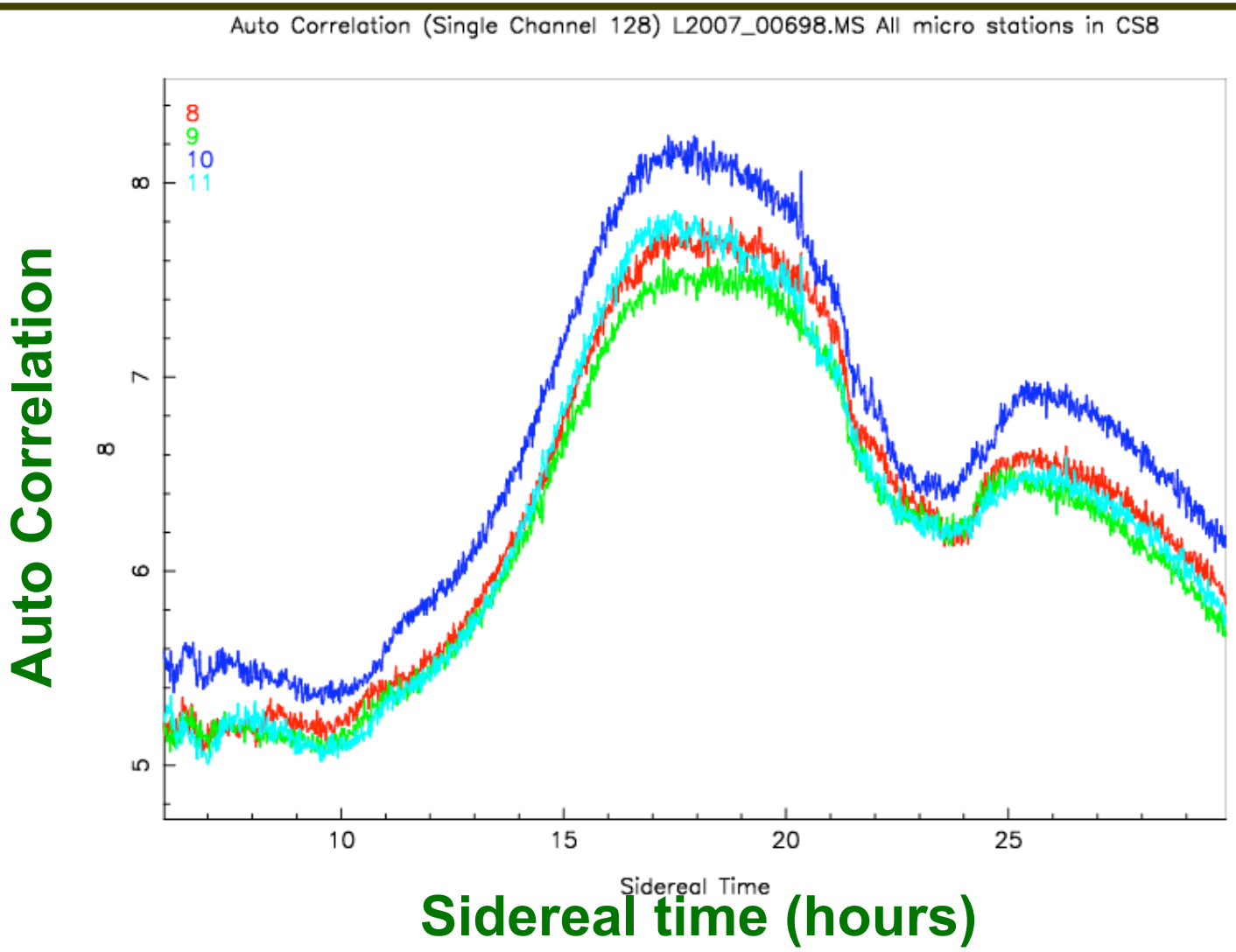
- More detailed look up on each auto correlation plots
- Cross correlations, Imaging.
- Calibration - BBS/Meq Tree.
- Analysis based on median filtering both time wise and frequency wise on a few data sets
- On average bad data flagged due to RFI (>4 sigma) ~ 0.5%

- Compare AIPS++ automatic flagger and existing flagger for LOFAR on real data.
- Depending upon how much RFI is remaining, more RFI mitigation algorithms need to be investigated??
- False RFI detection??

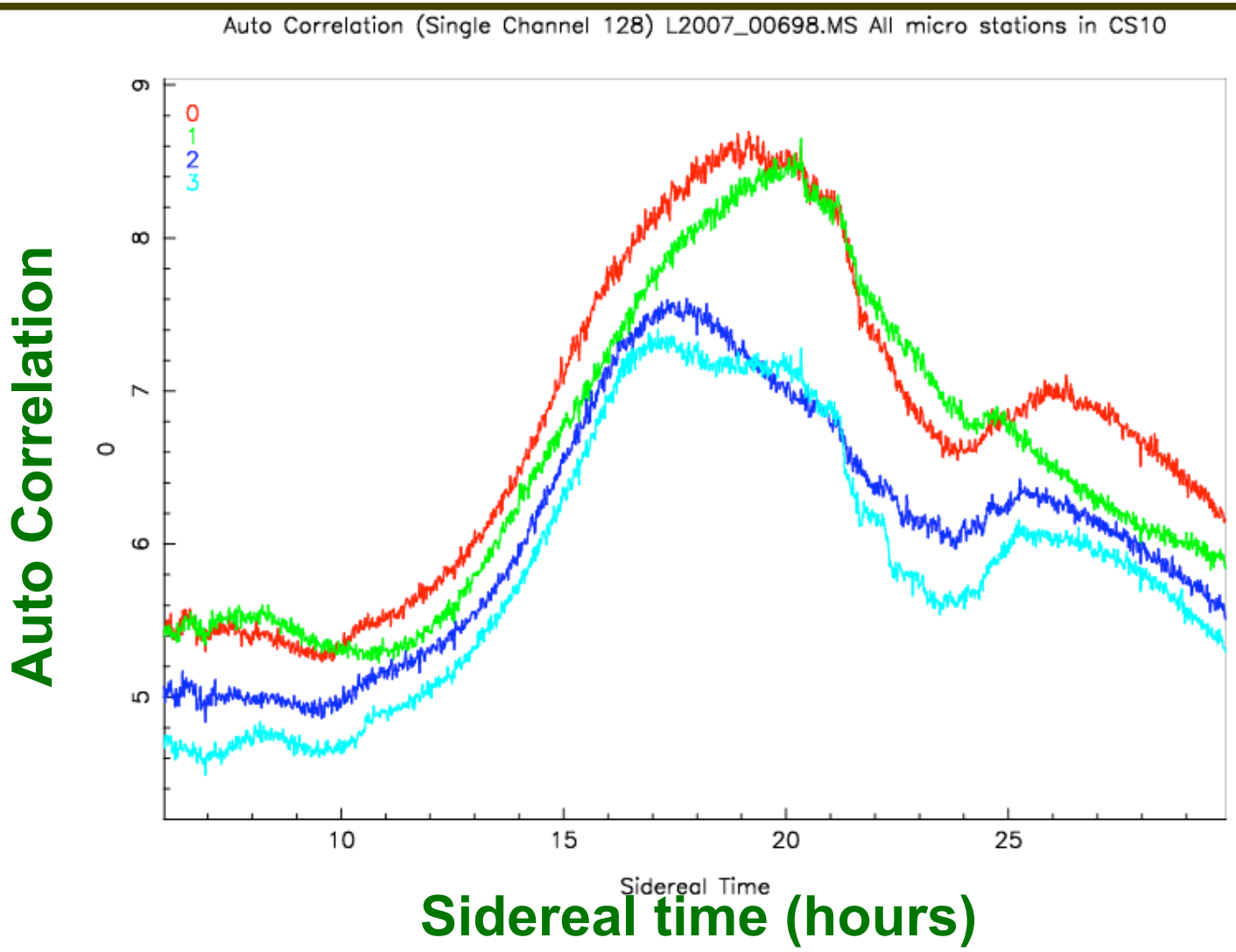
MS698Auto Correlation (XX) Channel 128 CS1



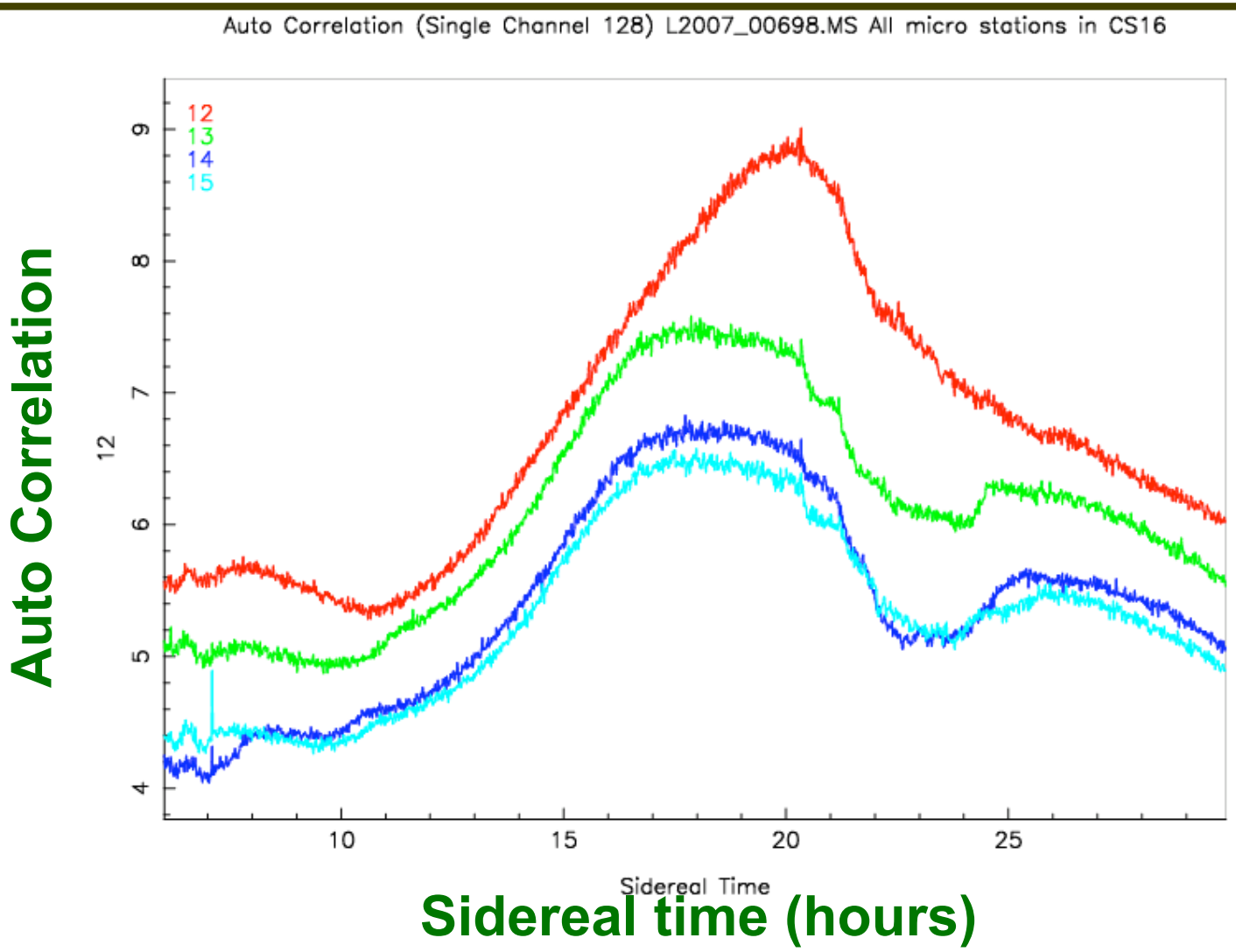
MS698Auto Correlation (XX) Channel 128 CS8



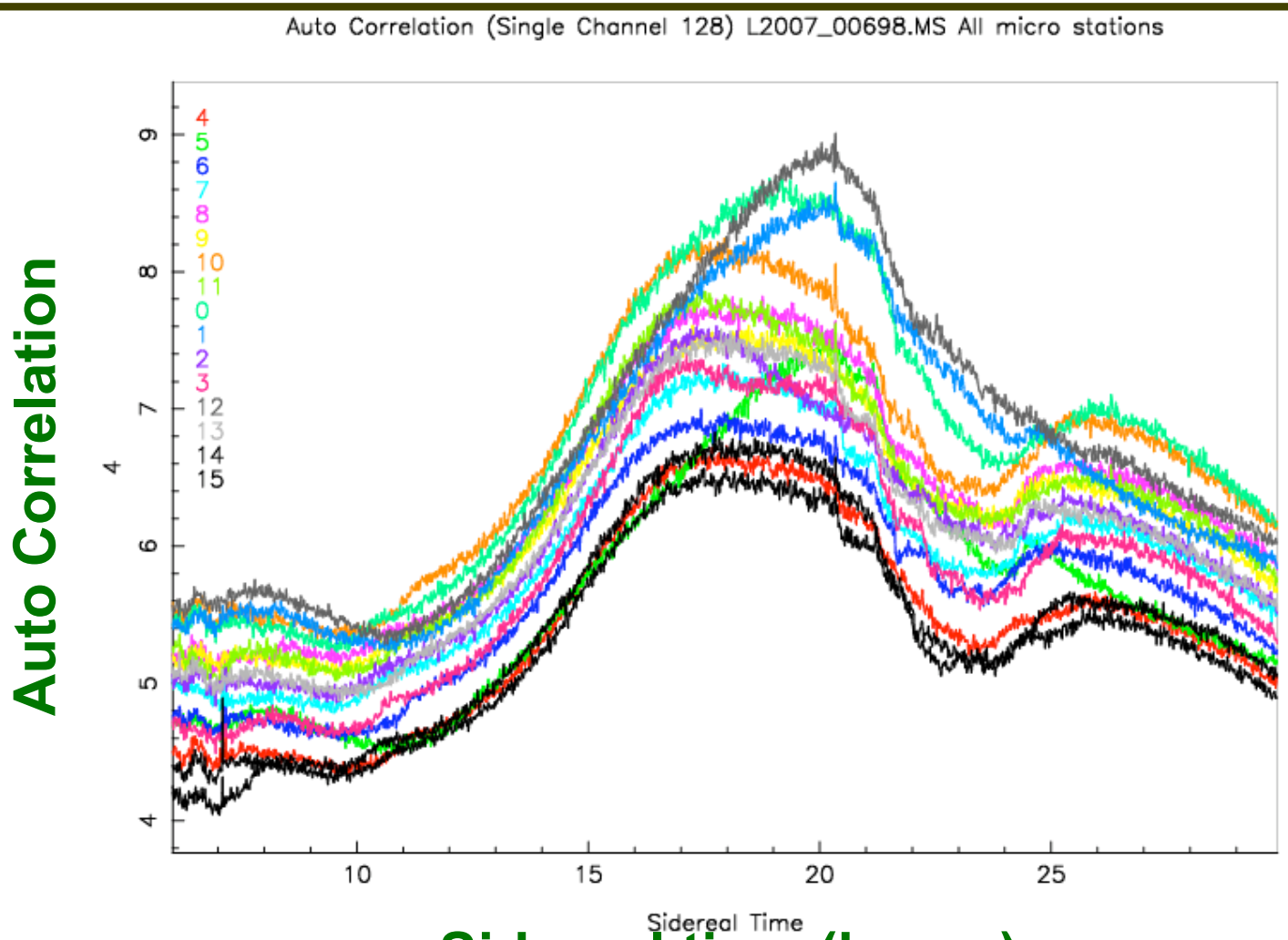
MS698Auto Correlation (XX) Channel 128 CS10



MS698Auto Correlation (XX) Channel 128 CS16



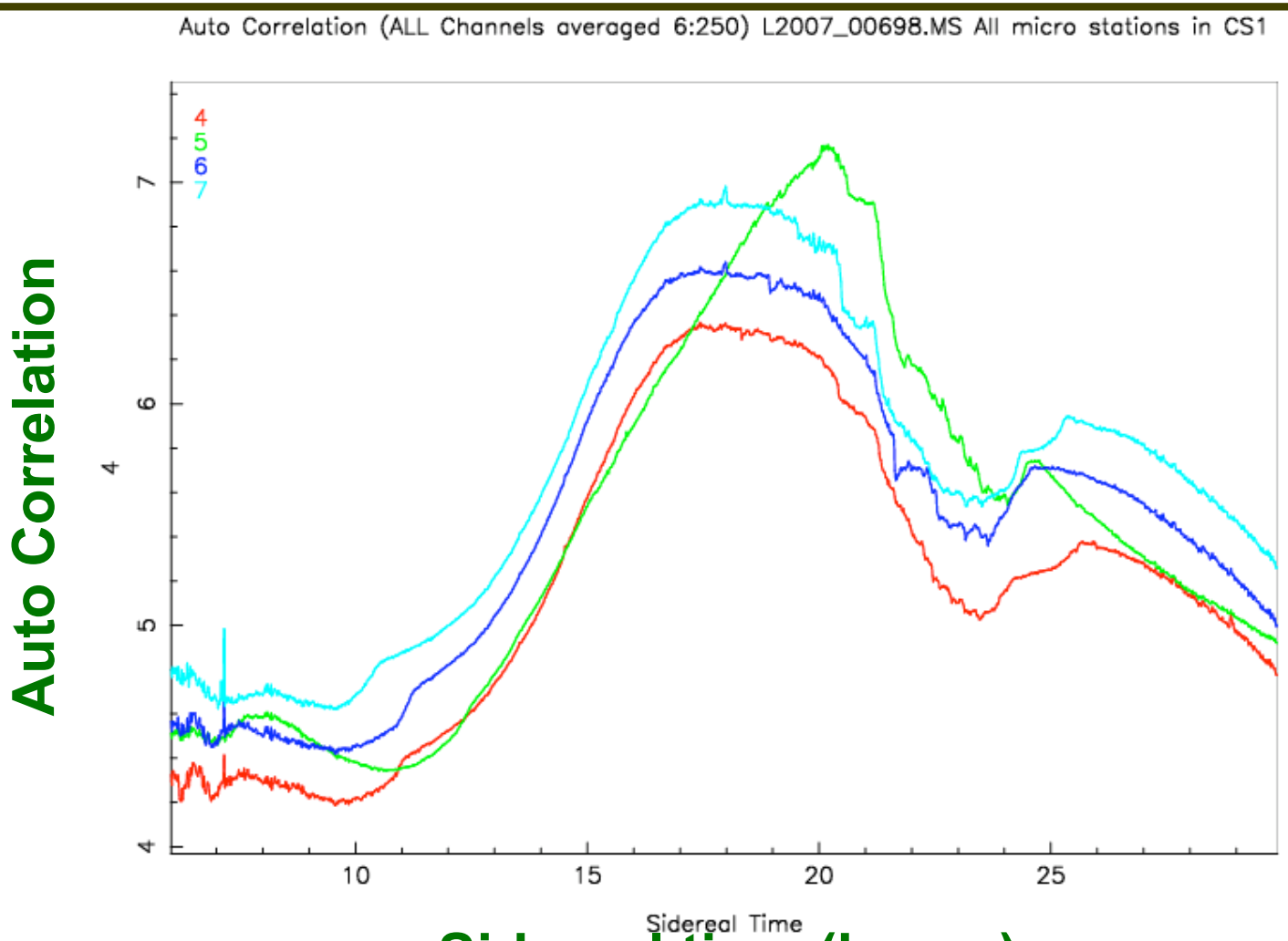
MS698Auto Correlation (XX) Channel 128 all microstations



Auto Correlation

Sidereal time (hours)

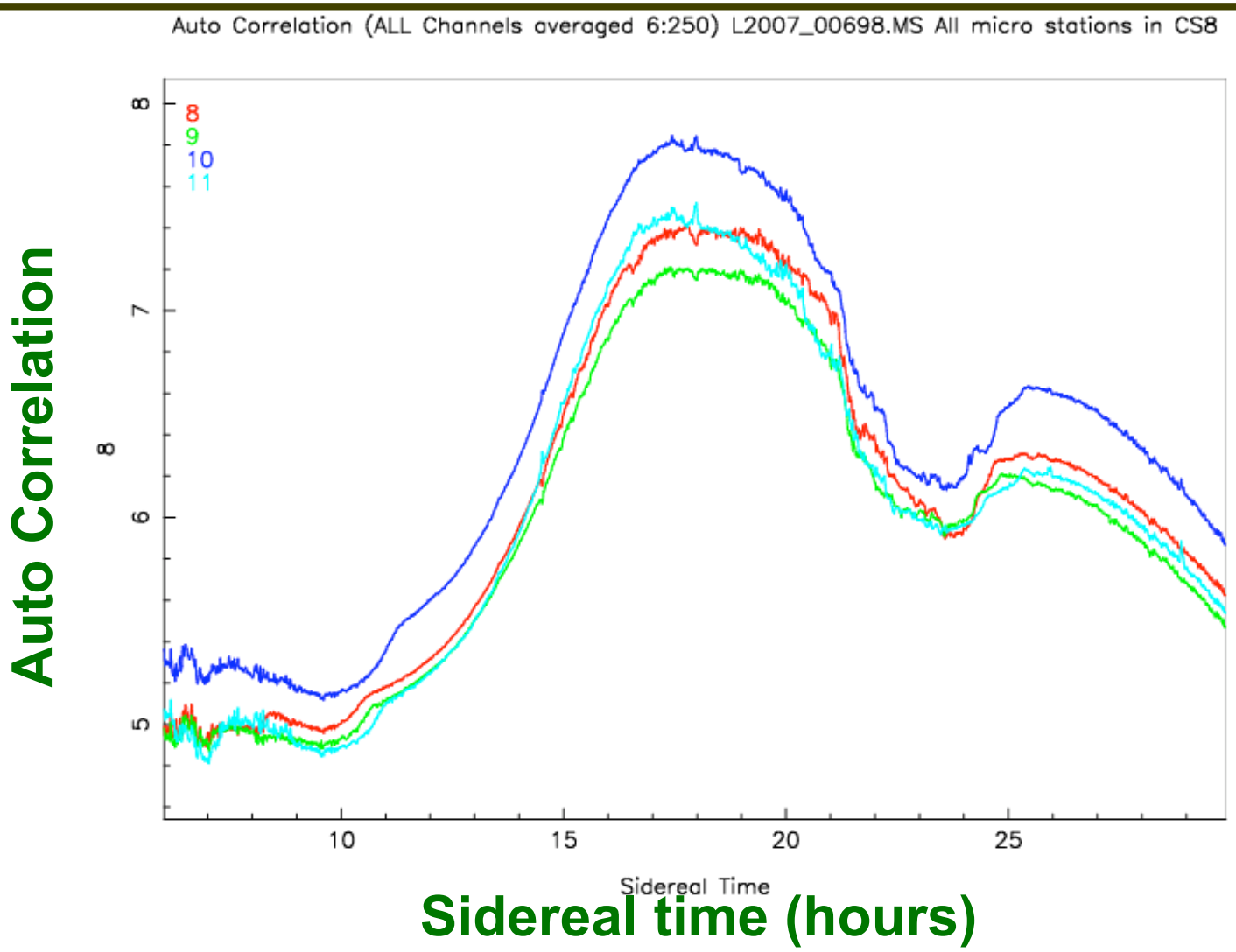
Auto Correlation (XX) avg Ch 6:250 CS1



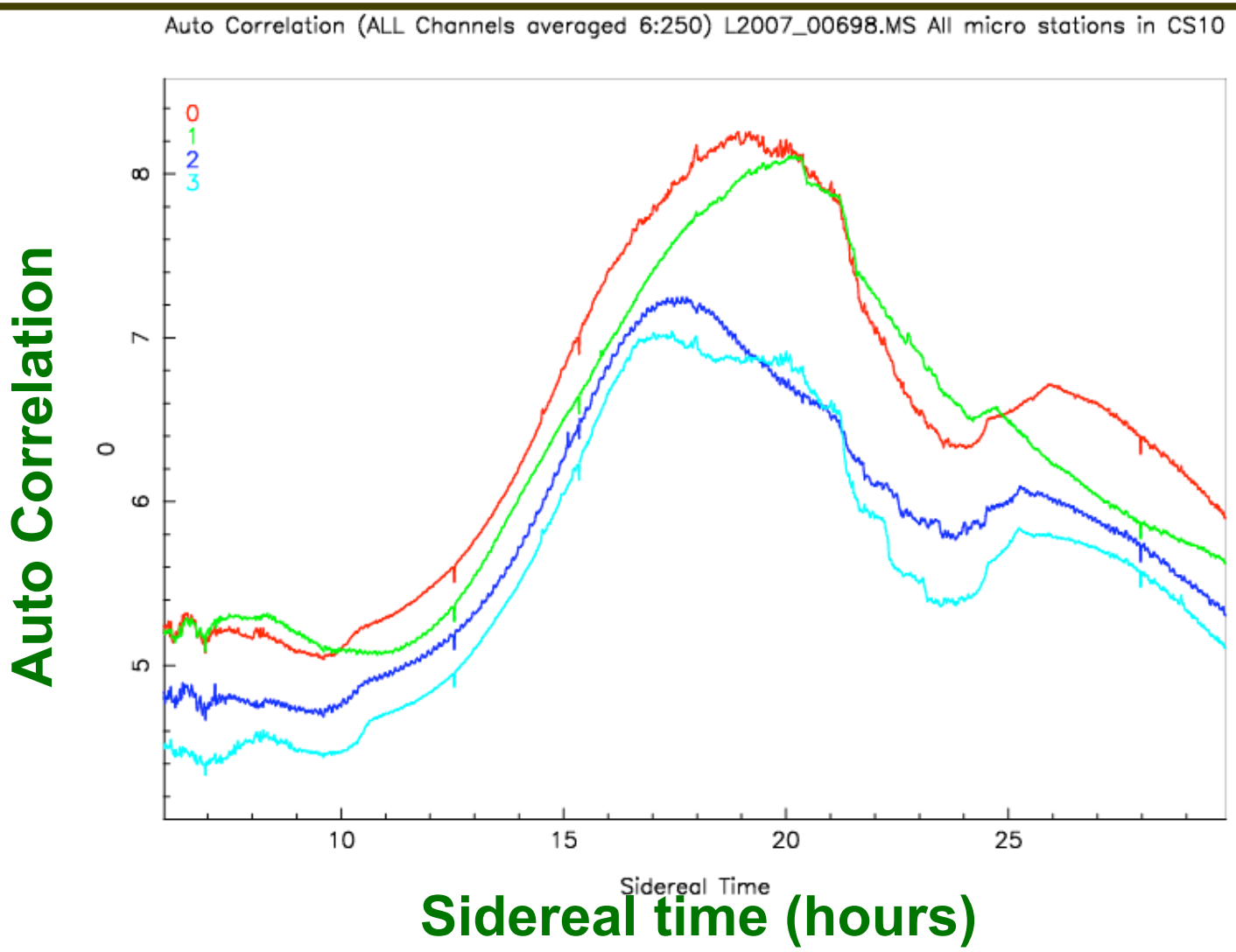
Auto Correlation

Sidereal time (hours)

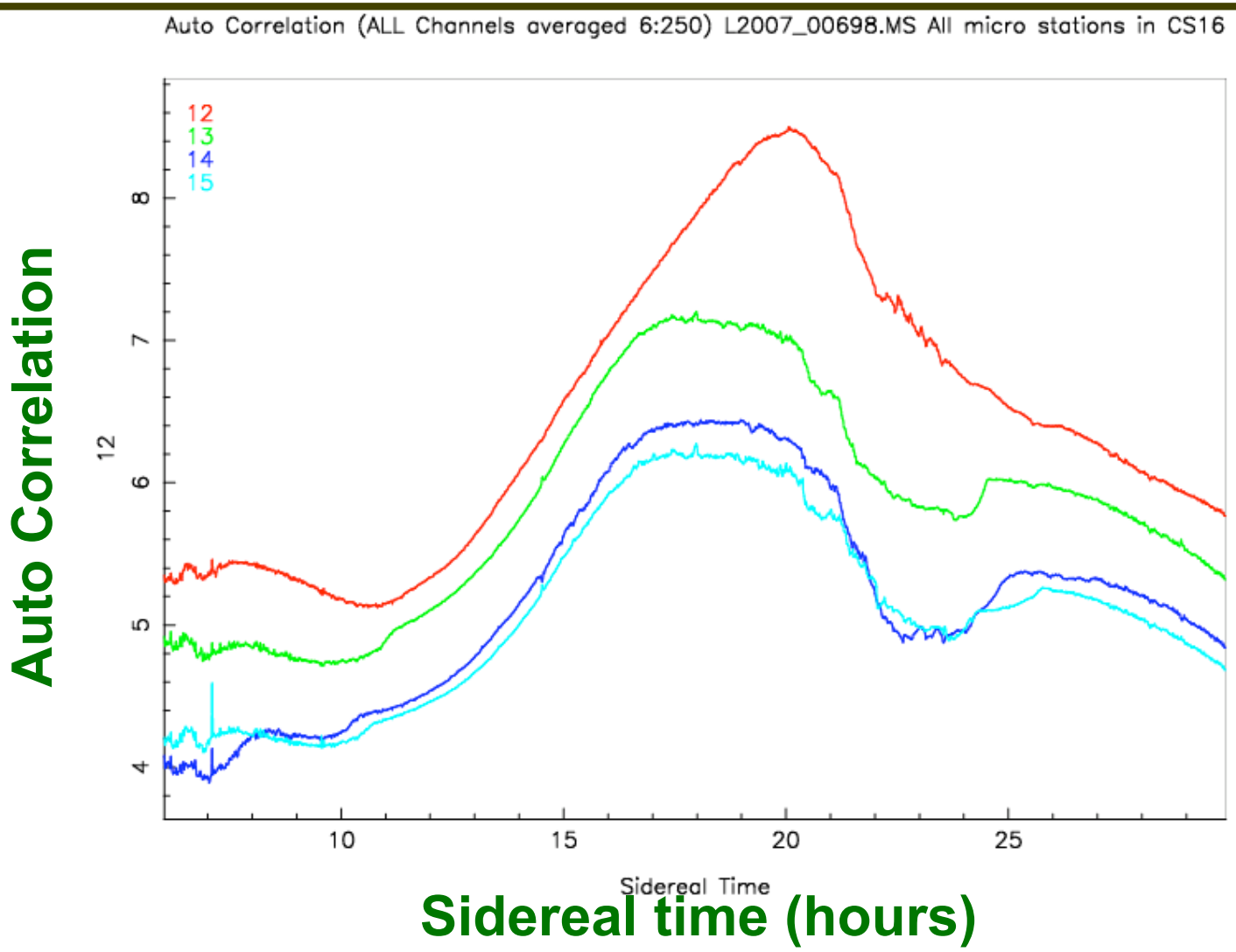
Auto Correlation (XX) avg Ch 6:250 CS8



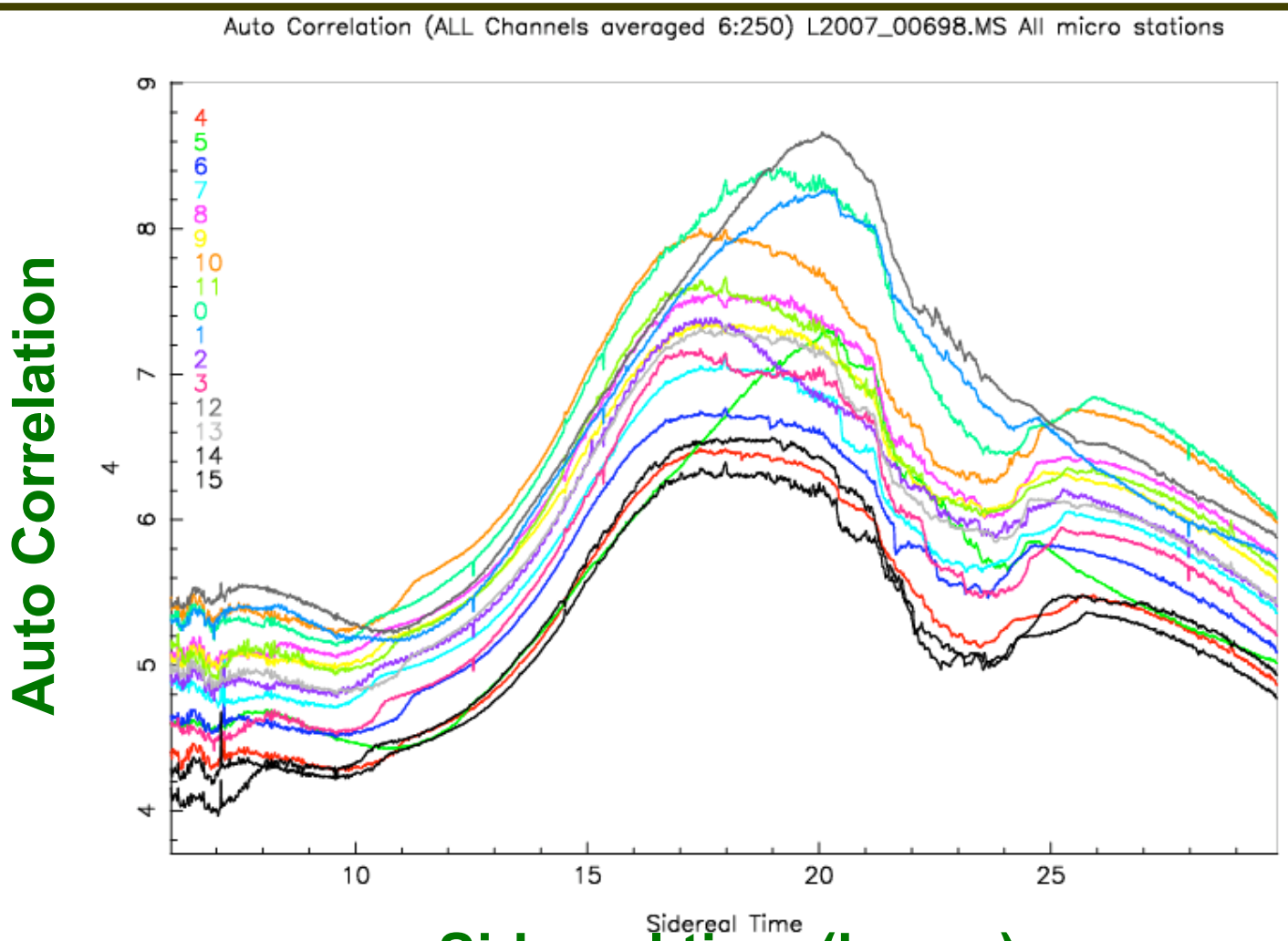
Auto Correlation (XX) avg Ch 6:250 CS10



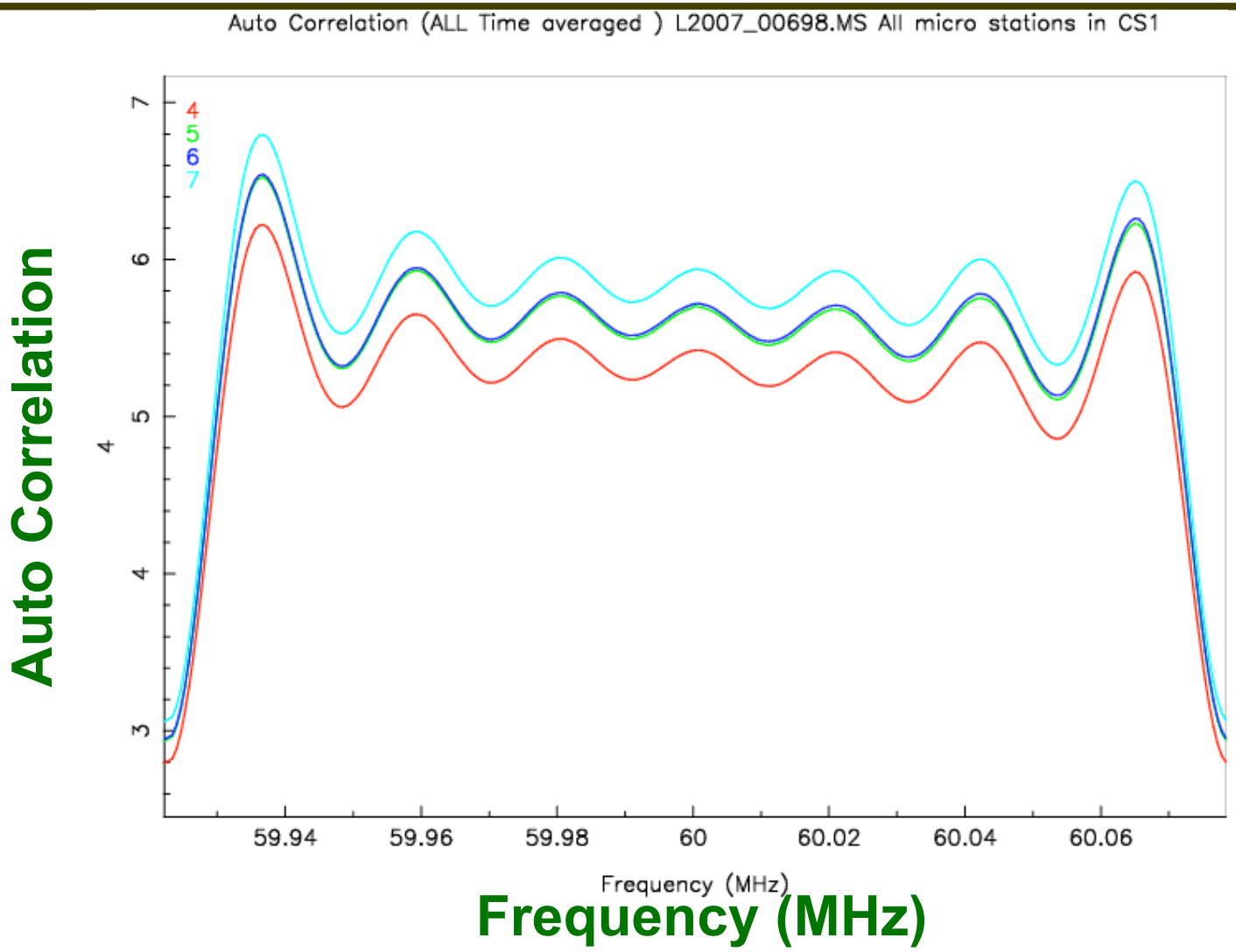
Auto Correlation (XX) avg Ch 6:250 CS16



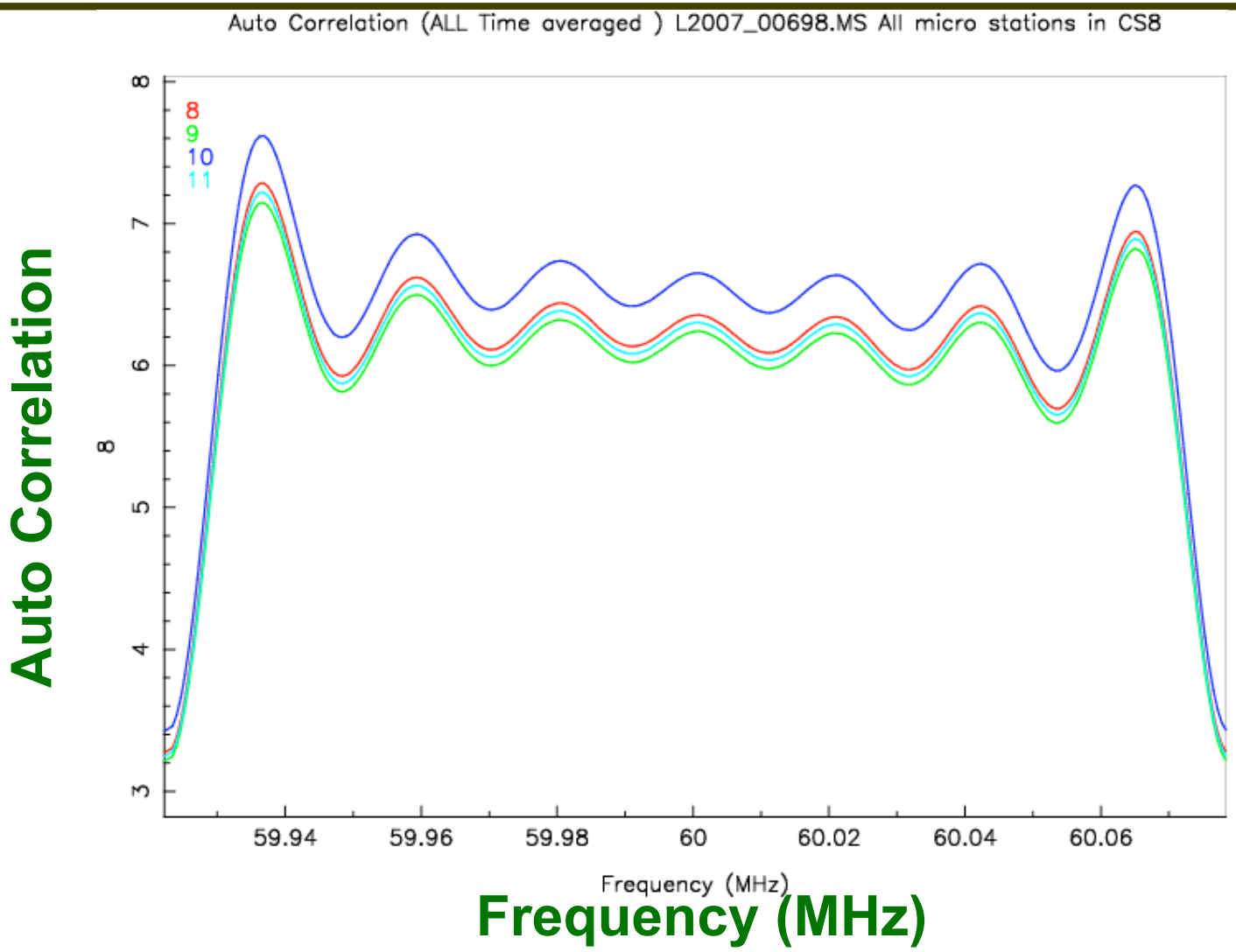
Auto Correlation (XX) avg Ch 6:250all microstn



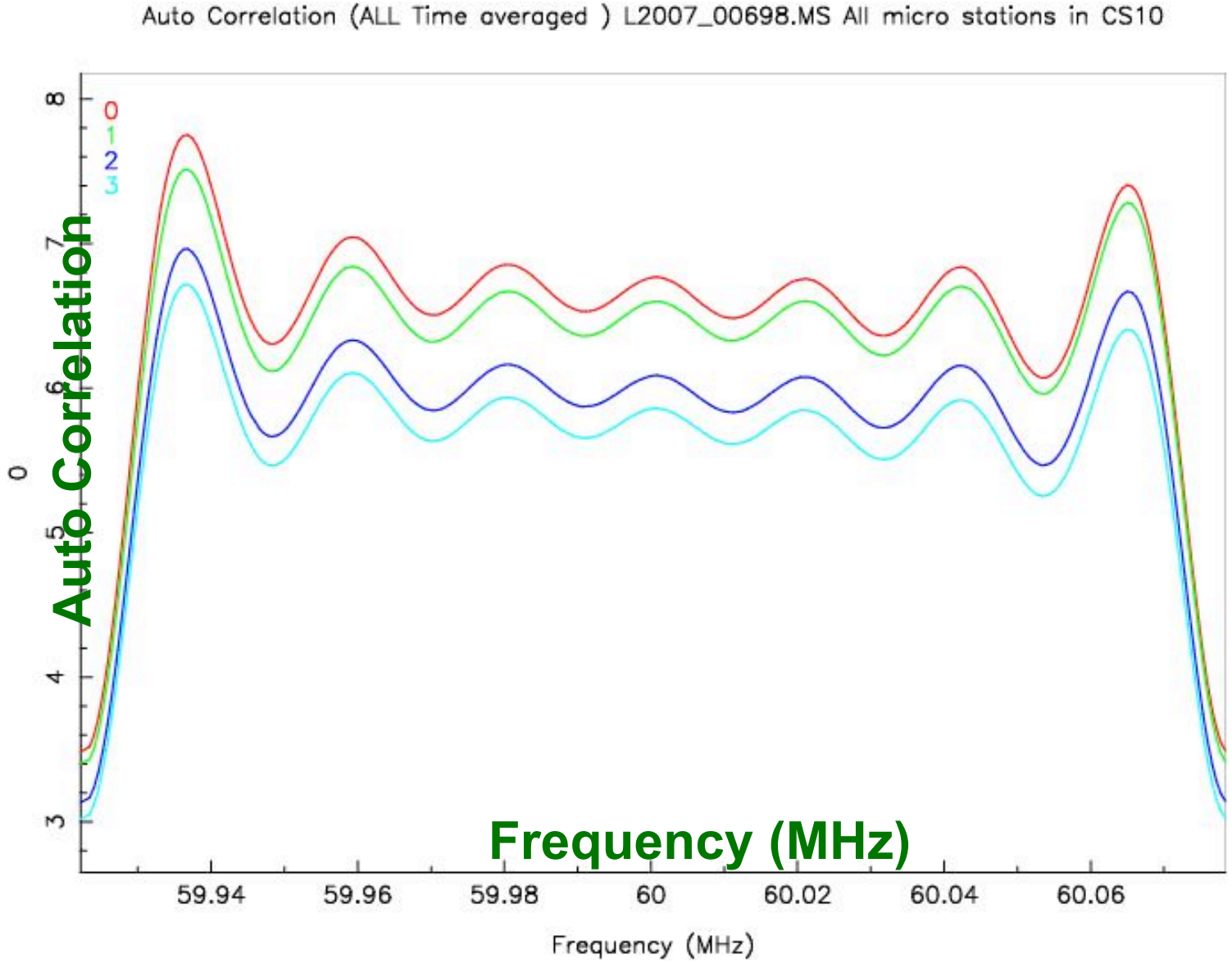
Auto Correlation (XX) (avg time) CS1



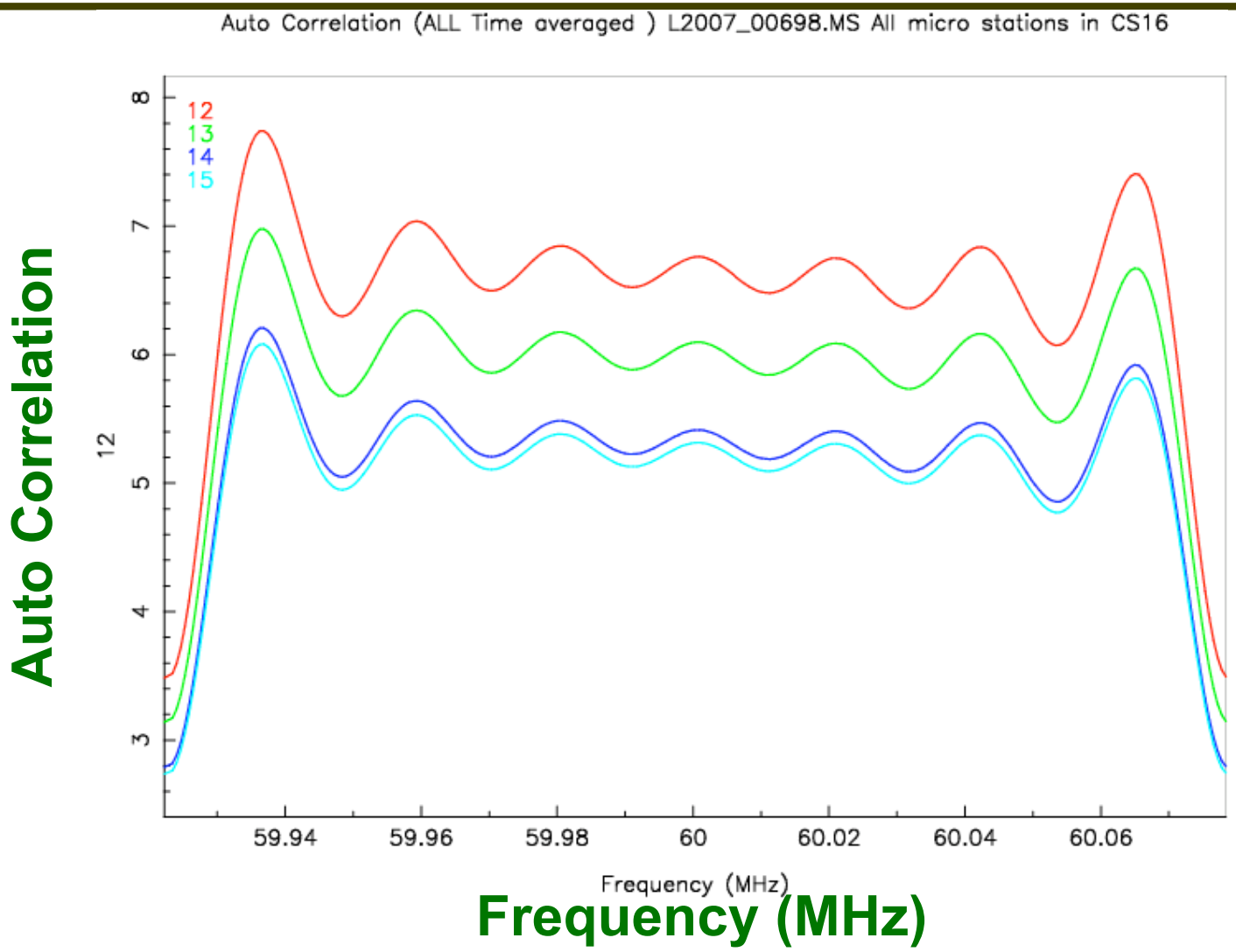
Auto Correlation (XX) (avg time) CS8



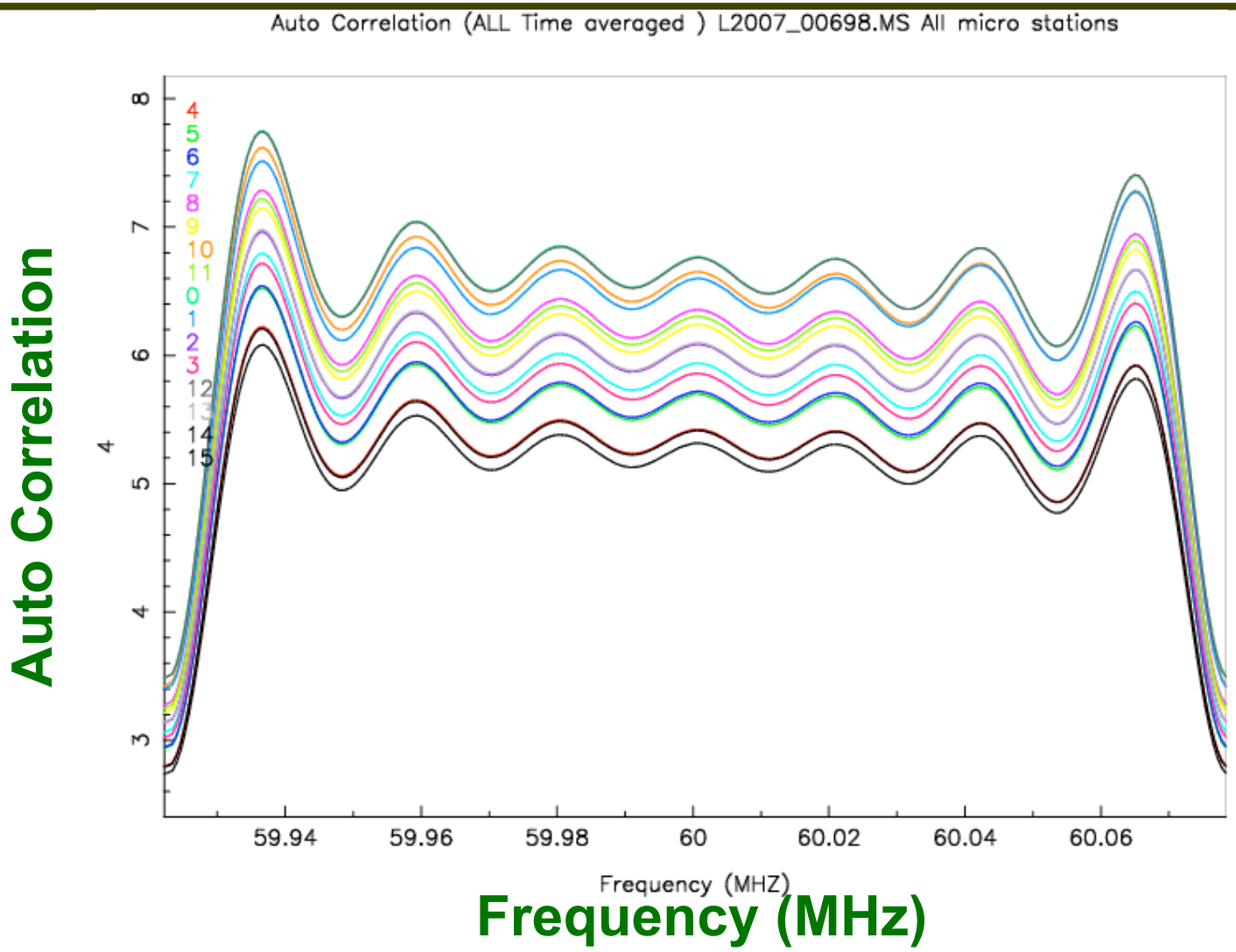
Auto Correlation (XX) (avg time) CS10



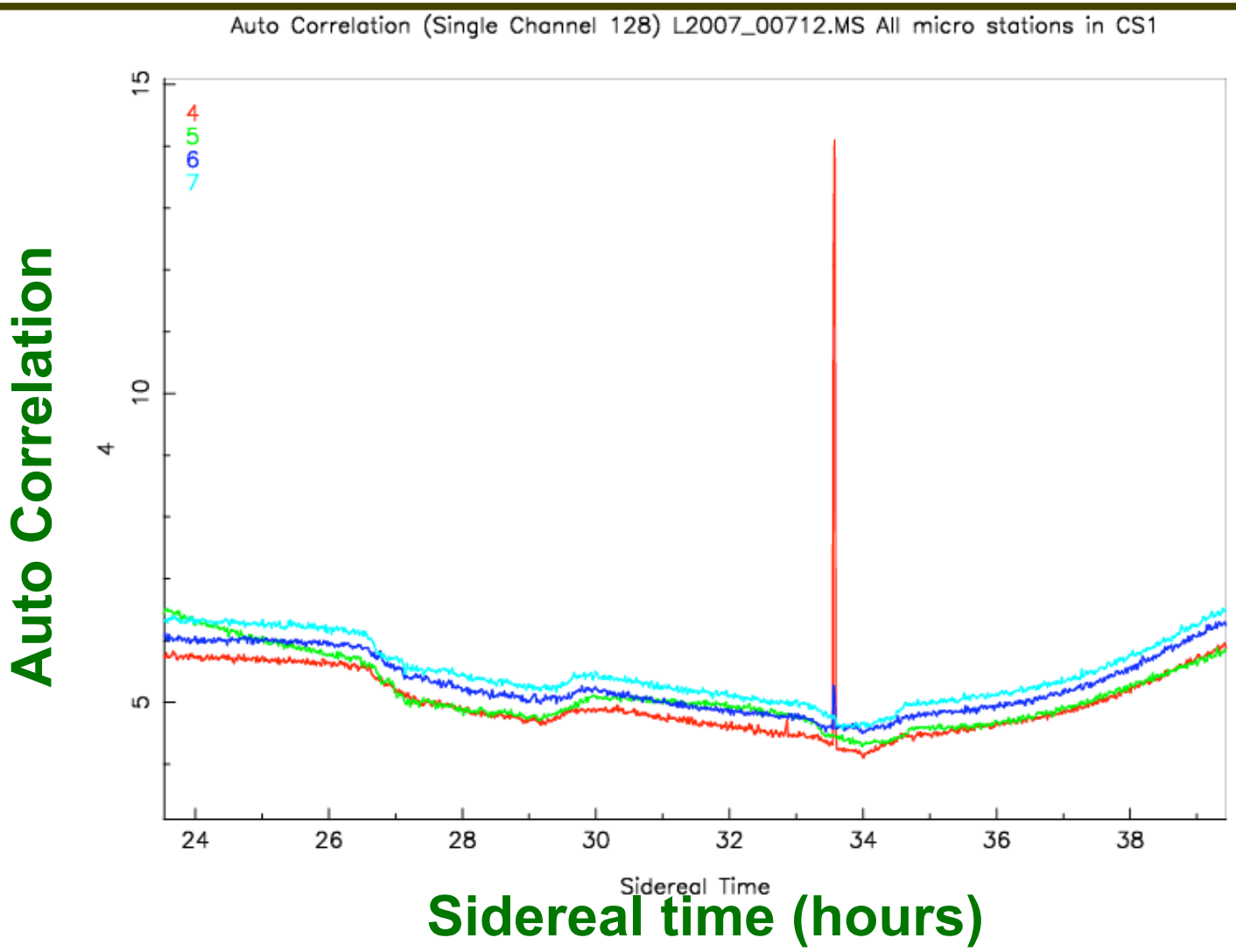
Auto Correlation (XX) (avg time) CS16



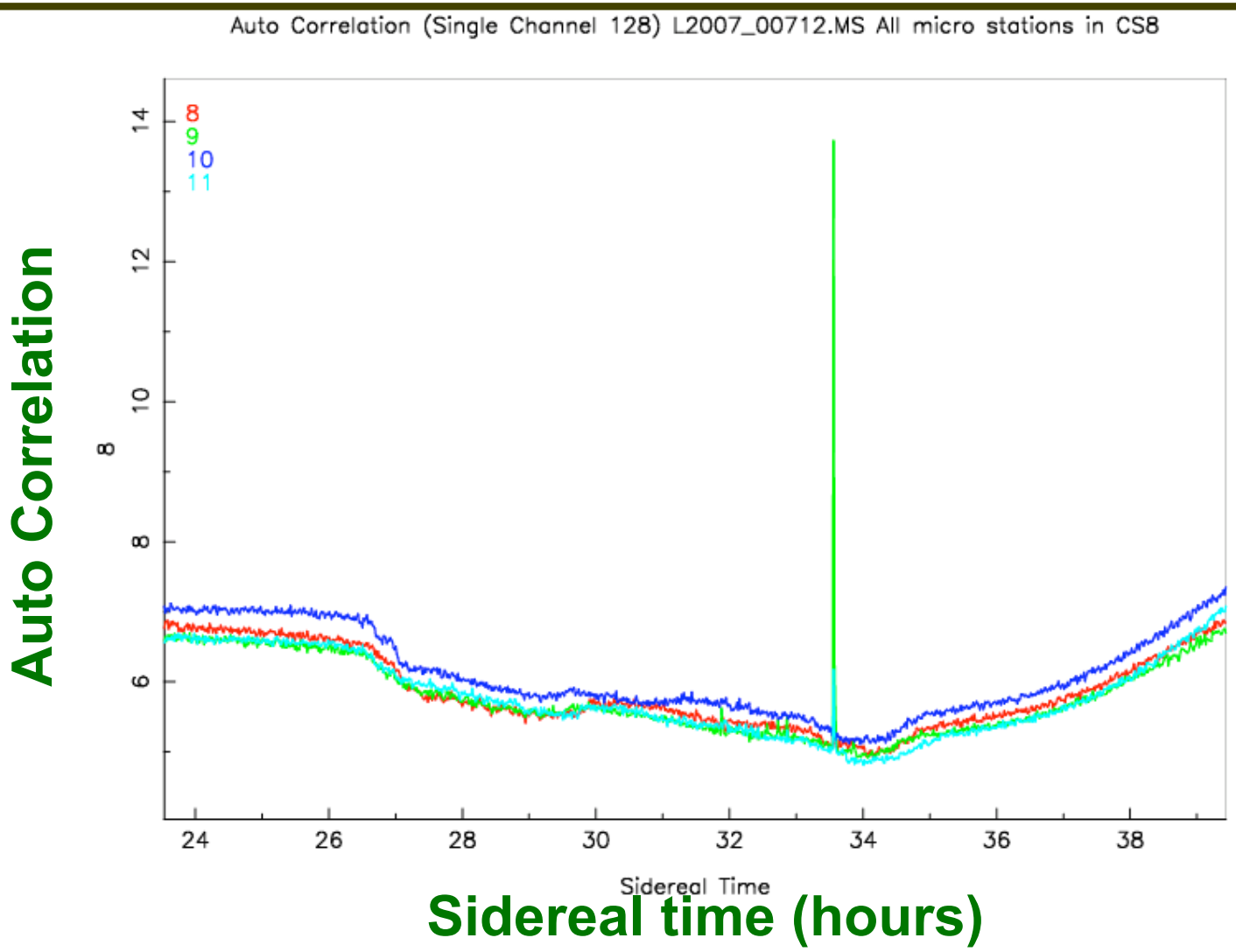
Auto Correlation (XX) (avg time) all mstns



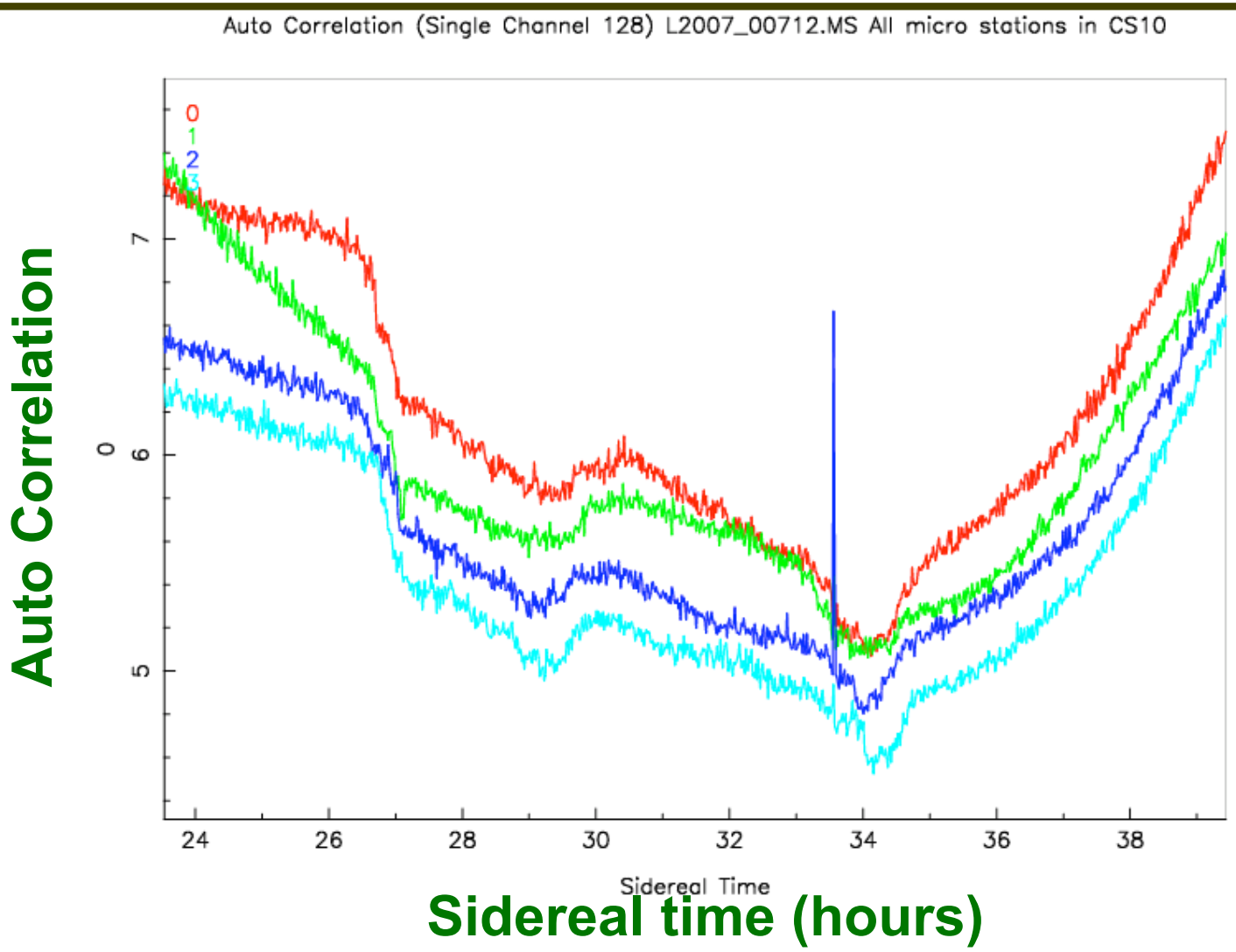
MS712Auto Correlation (XX) Channel 128
CS1



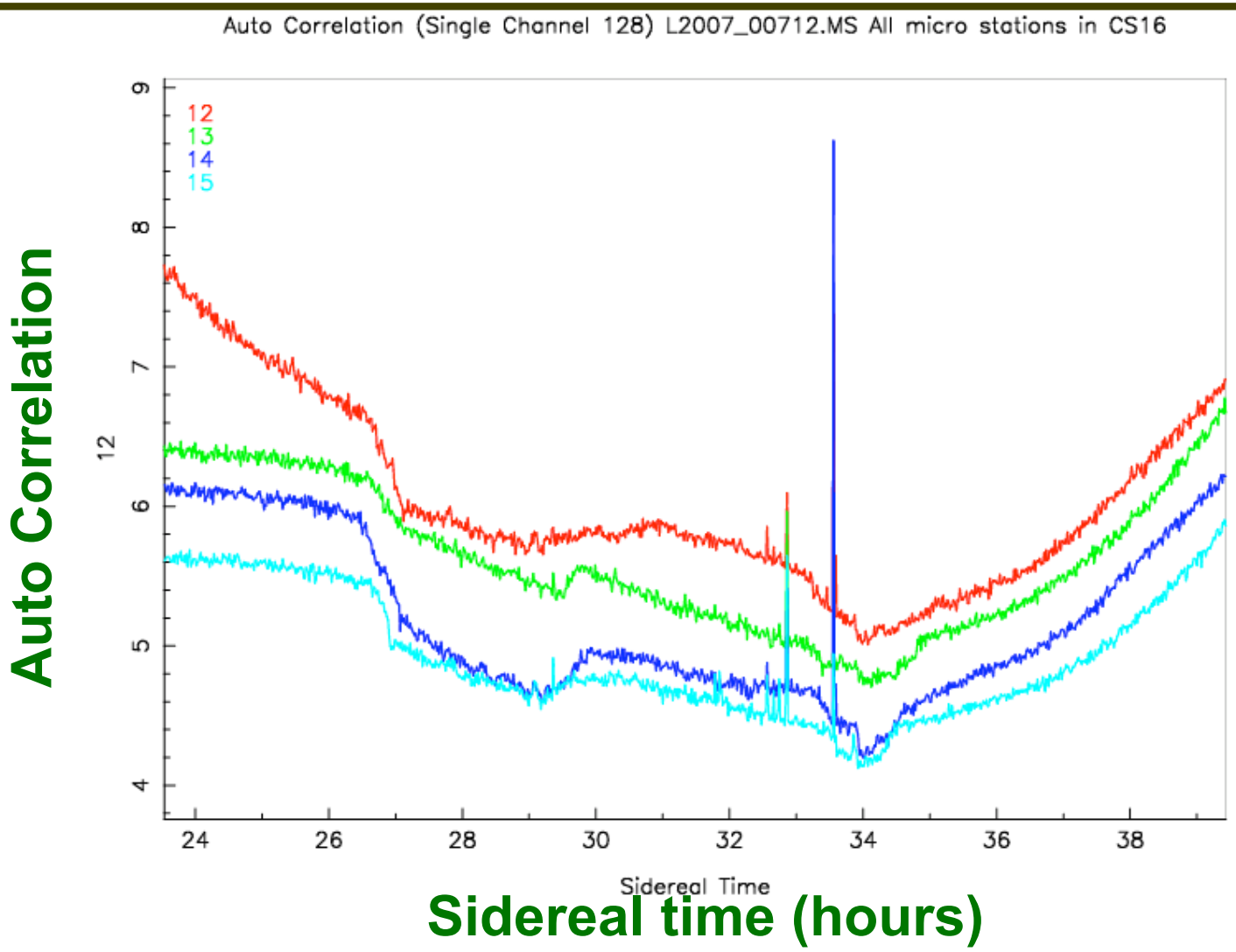
MS712Auto Correlation (XX) Channel 128 CS8



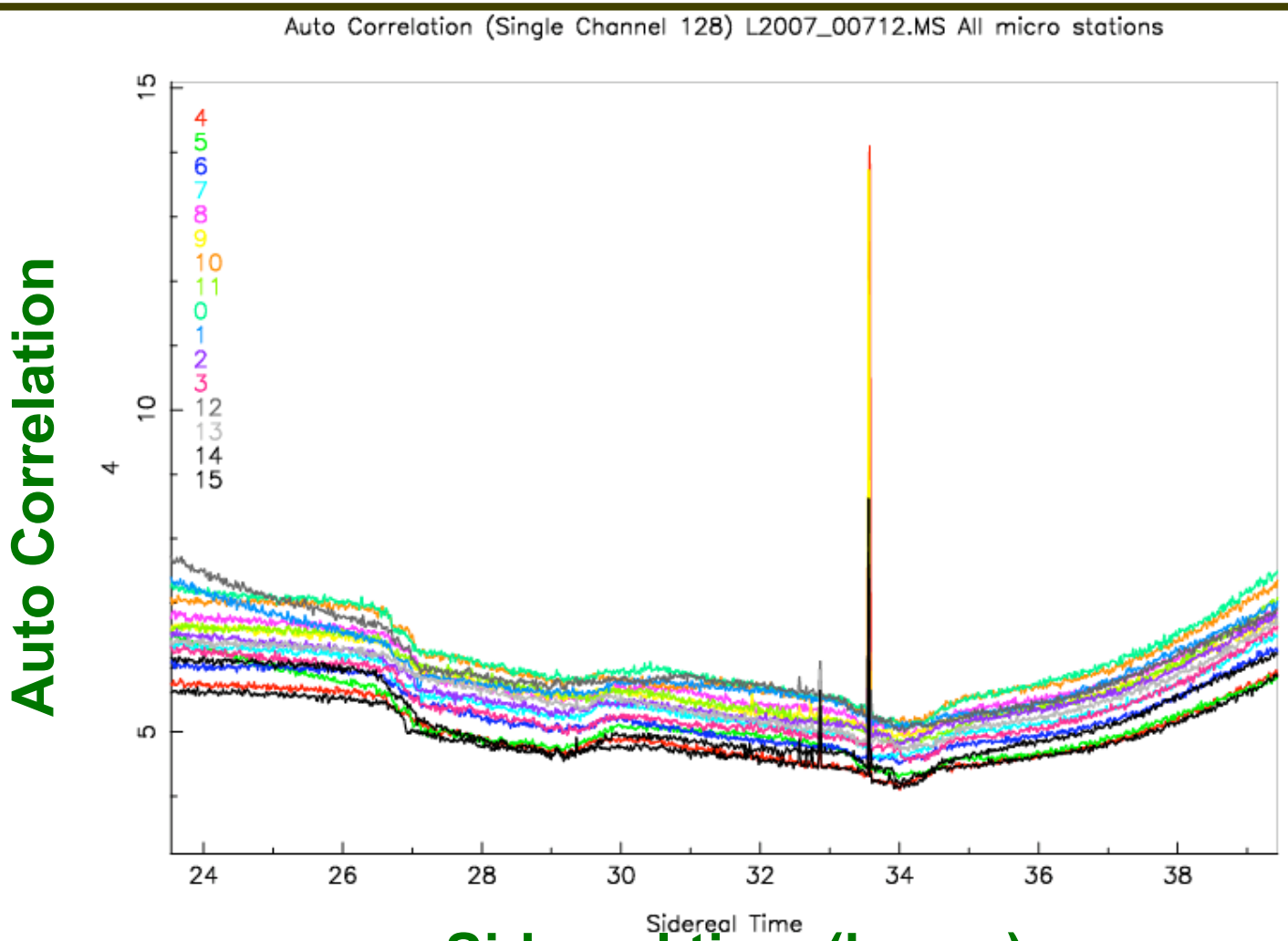
MS712Auto Correlation (XX) Channel 128 CS10



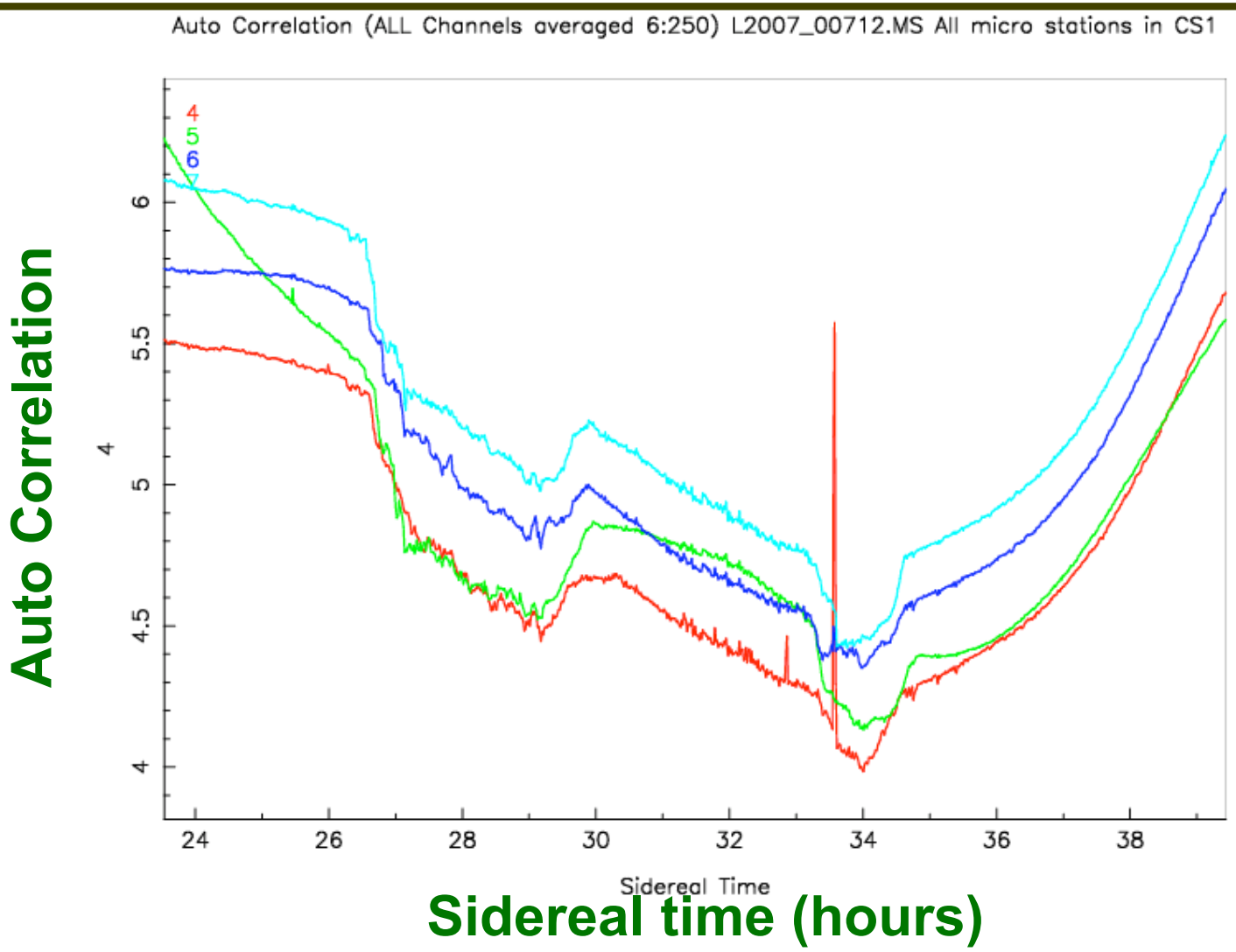
MS712Auto Correlation (XX) Channel 128 CS16



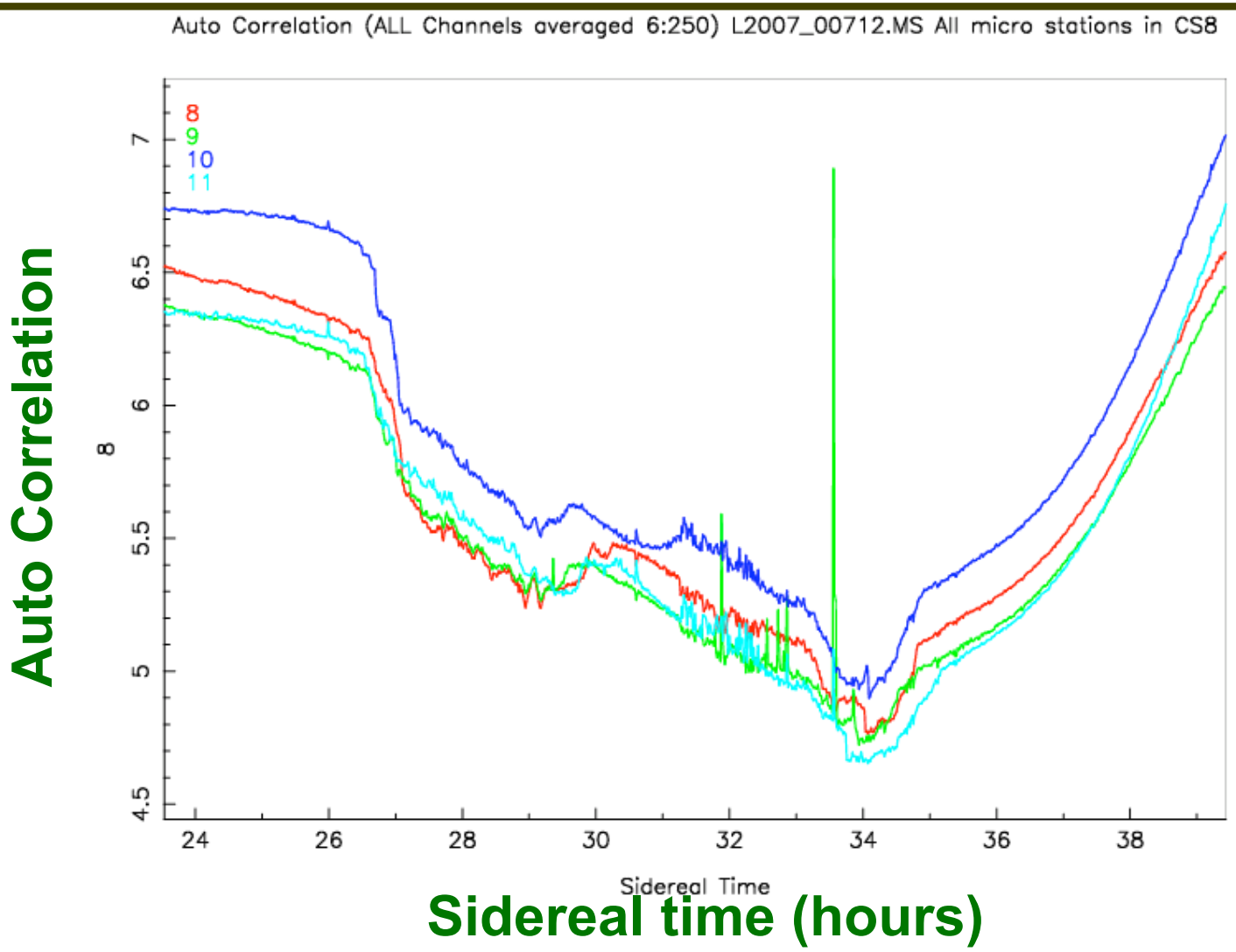
MS712Auto Correlation (XX) Channel 128 all microstations



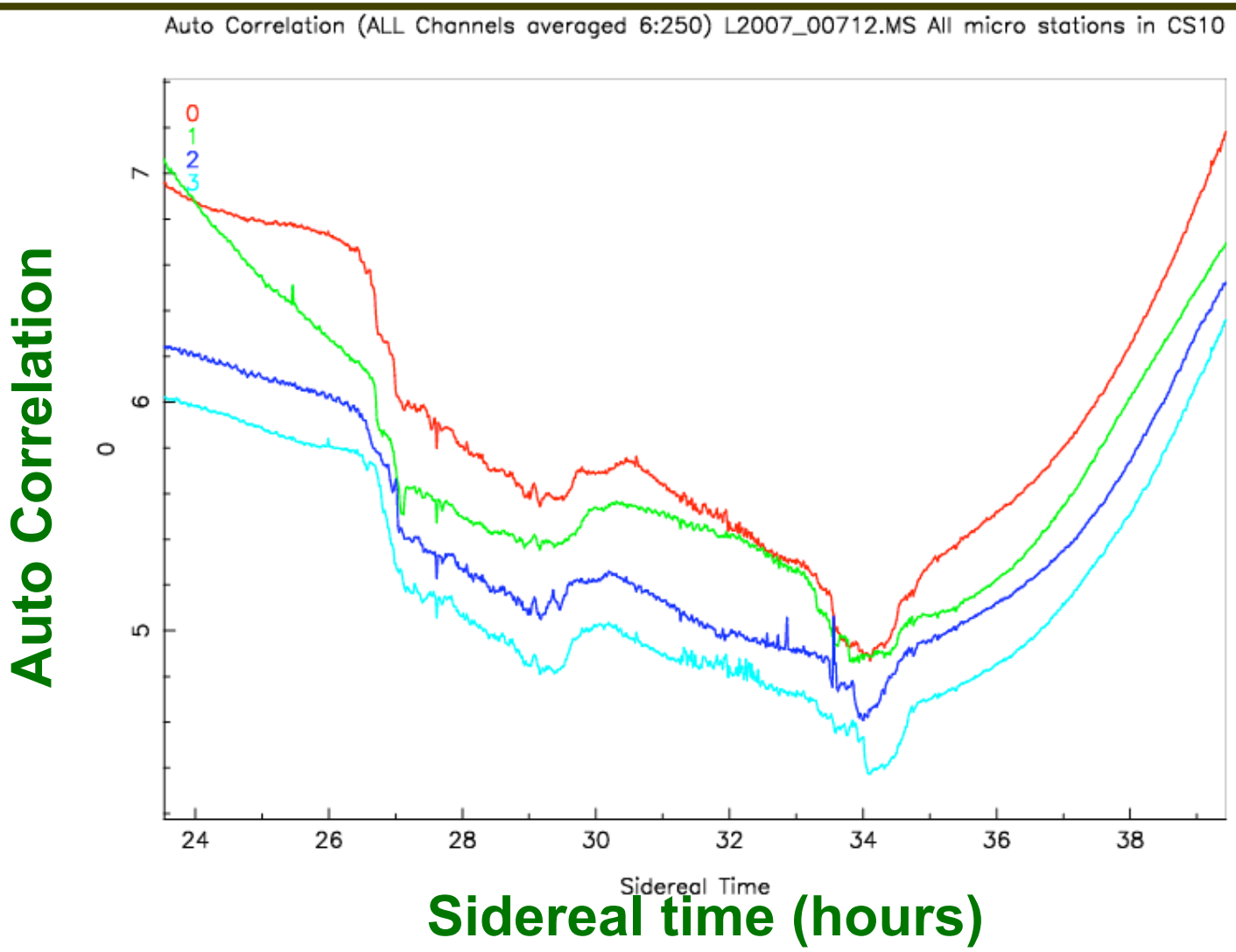
Auto Correlation (XX) avg Ch 6:250 CS1



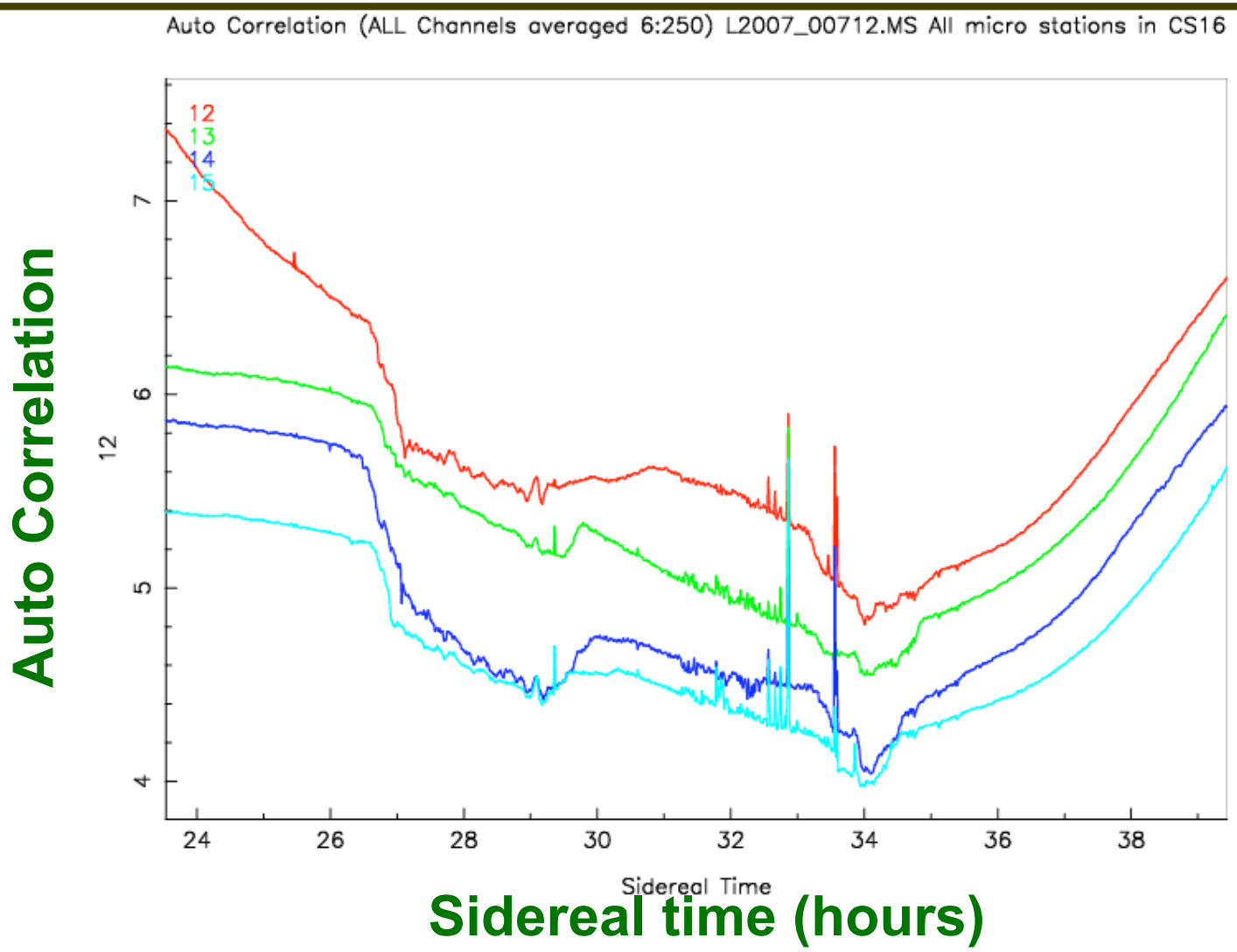
Auto Correlation (XX) avg Ch 6:250 CS8



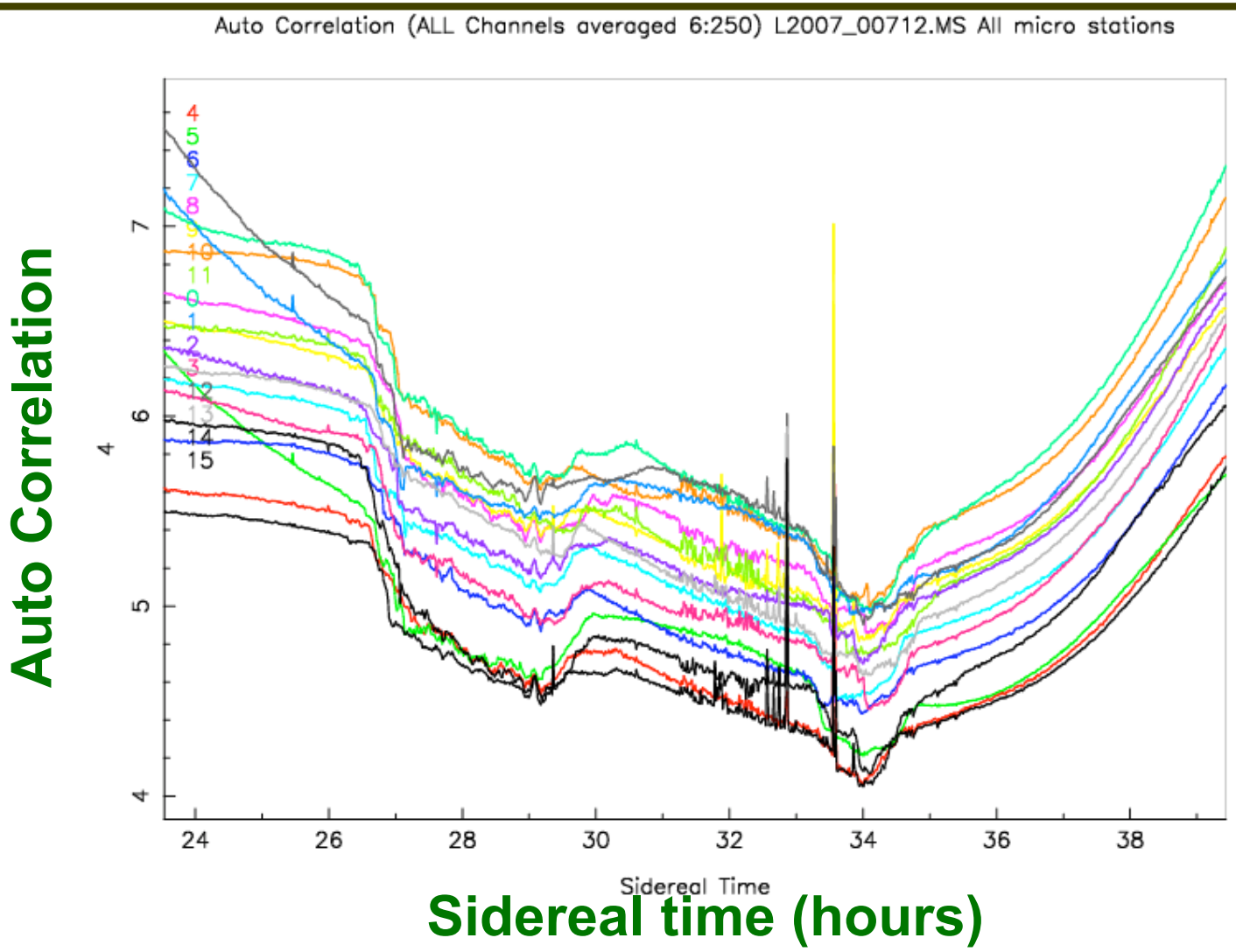
Auto Correlation (XX) avg Ch 6:250 CS10



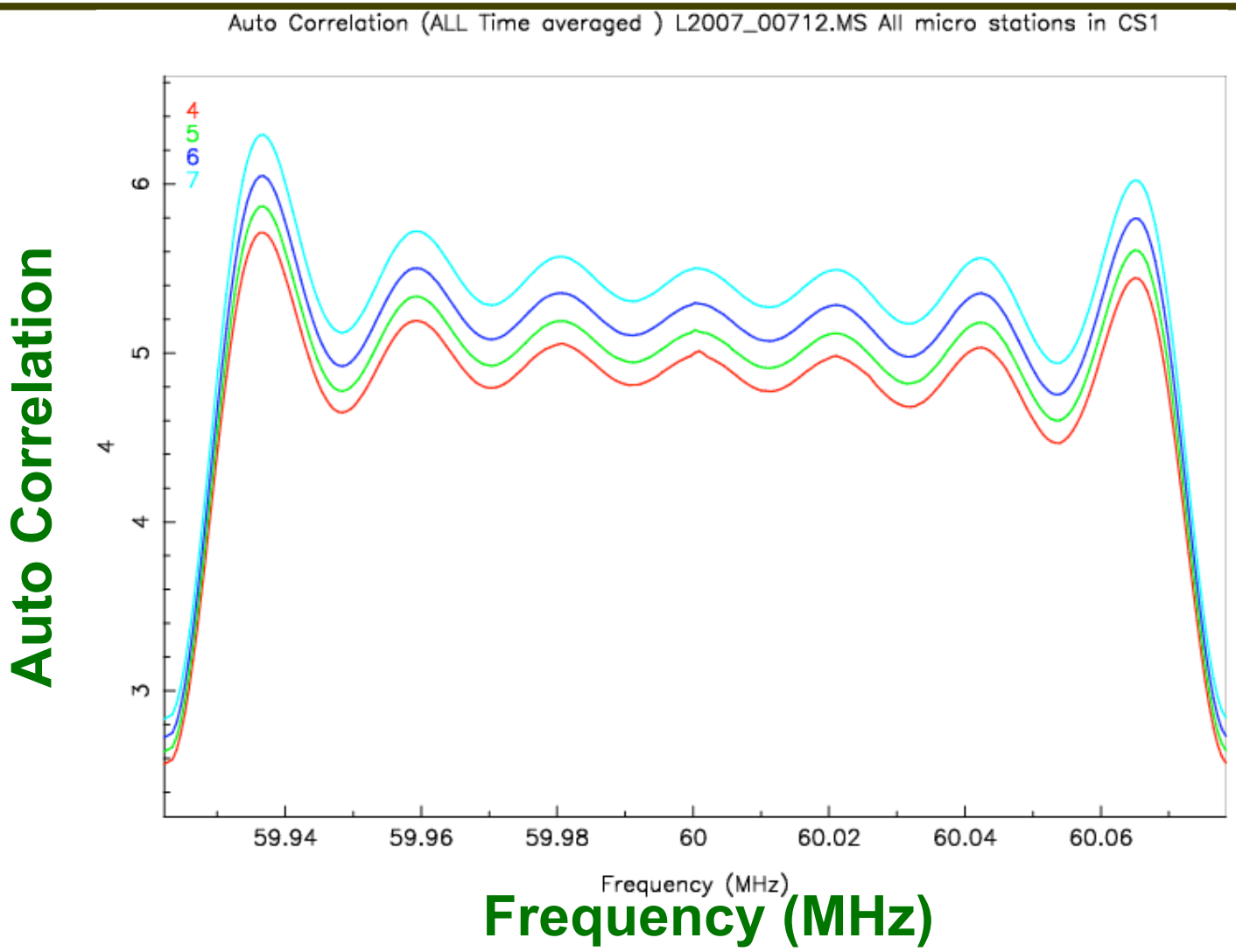
Auto Correlation (XX) avg Ch 6:250 CS16



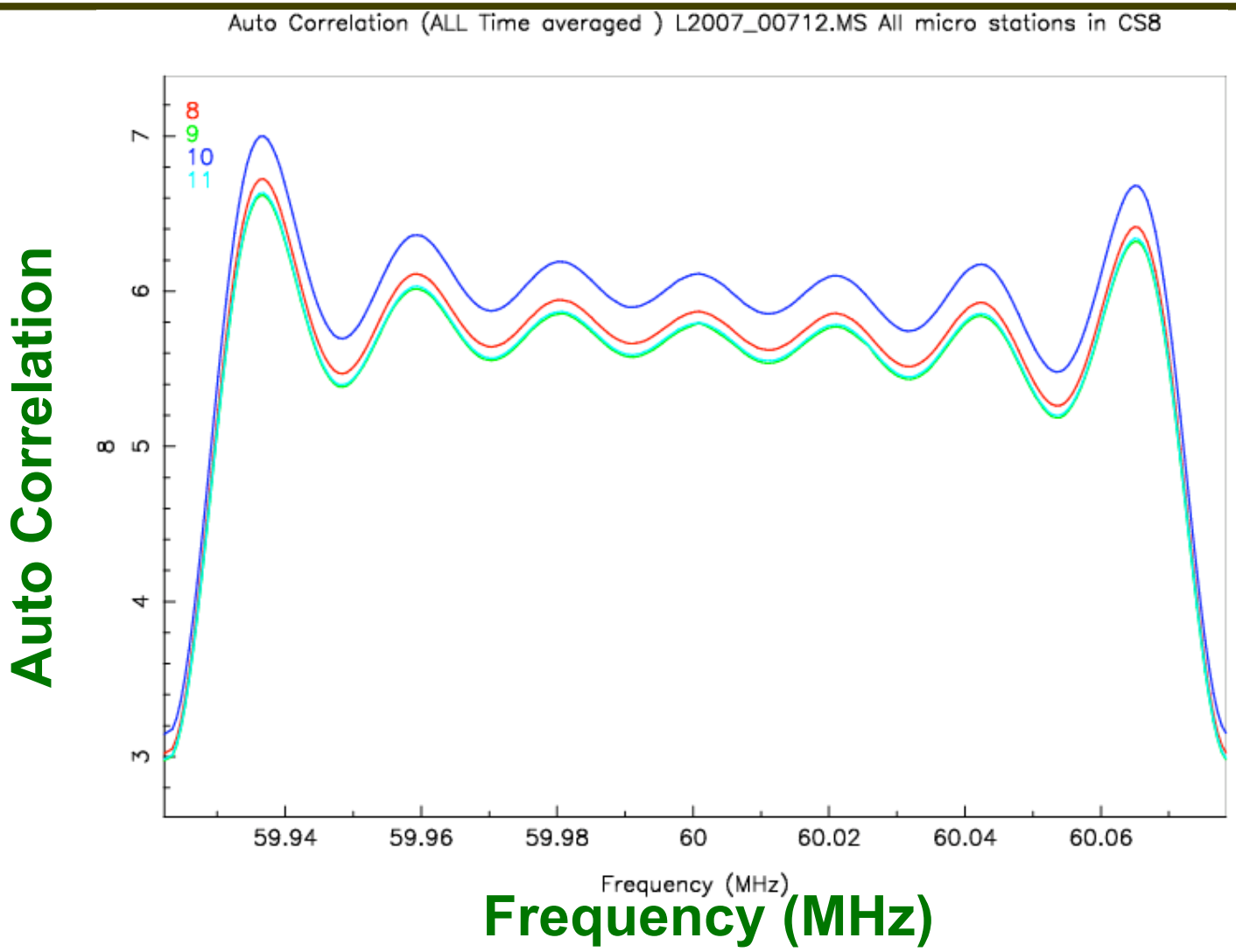
Auto Correlation (XX) avg Ch 6:250all microstn



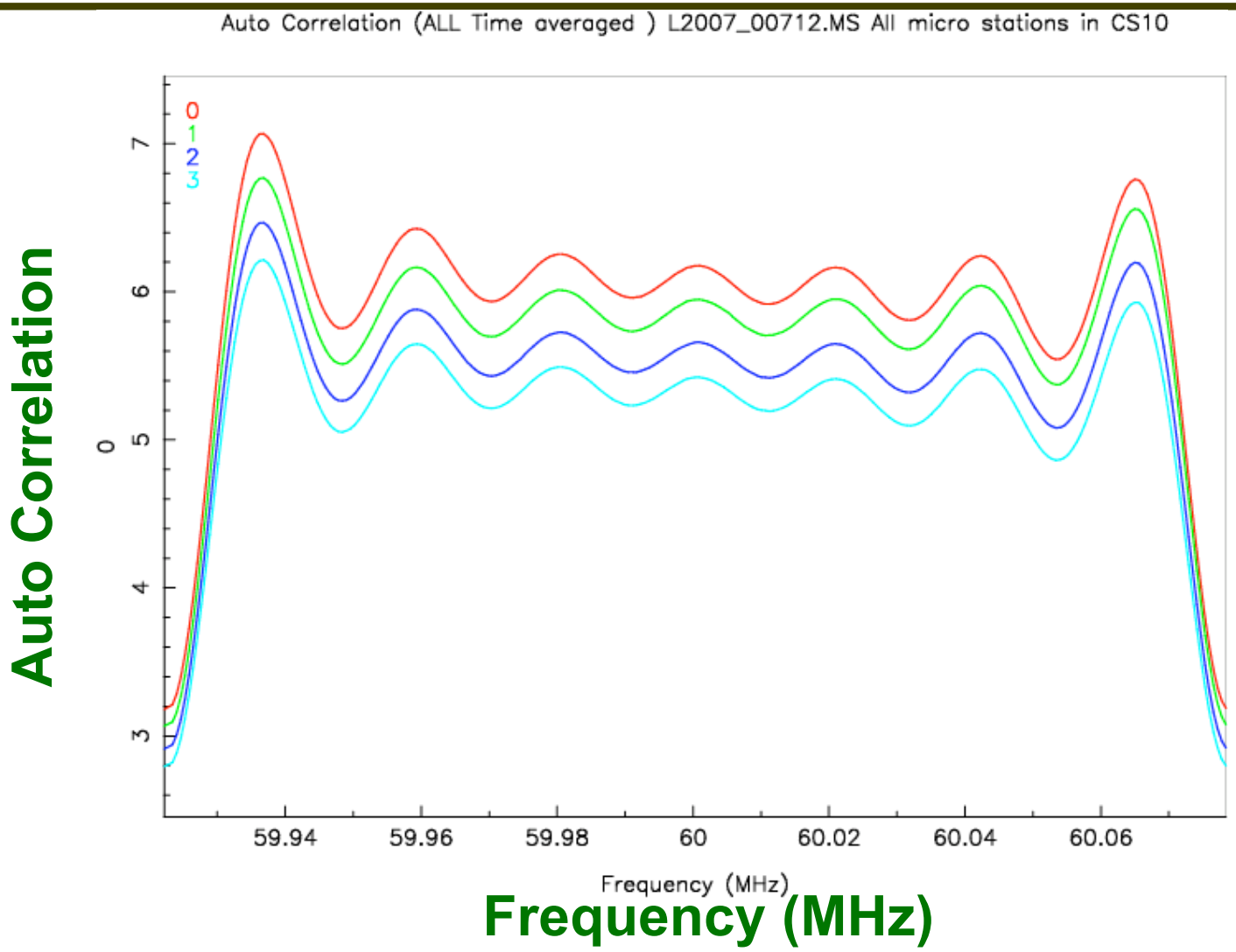
Auto Correlation (XX) (avg time) CS1



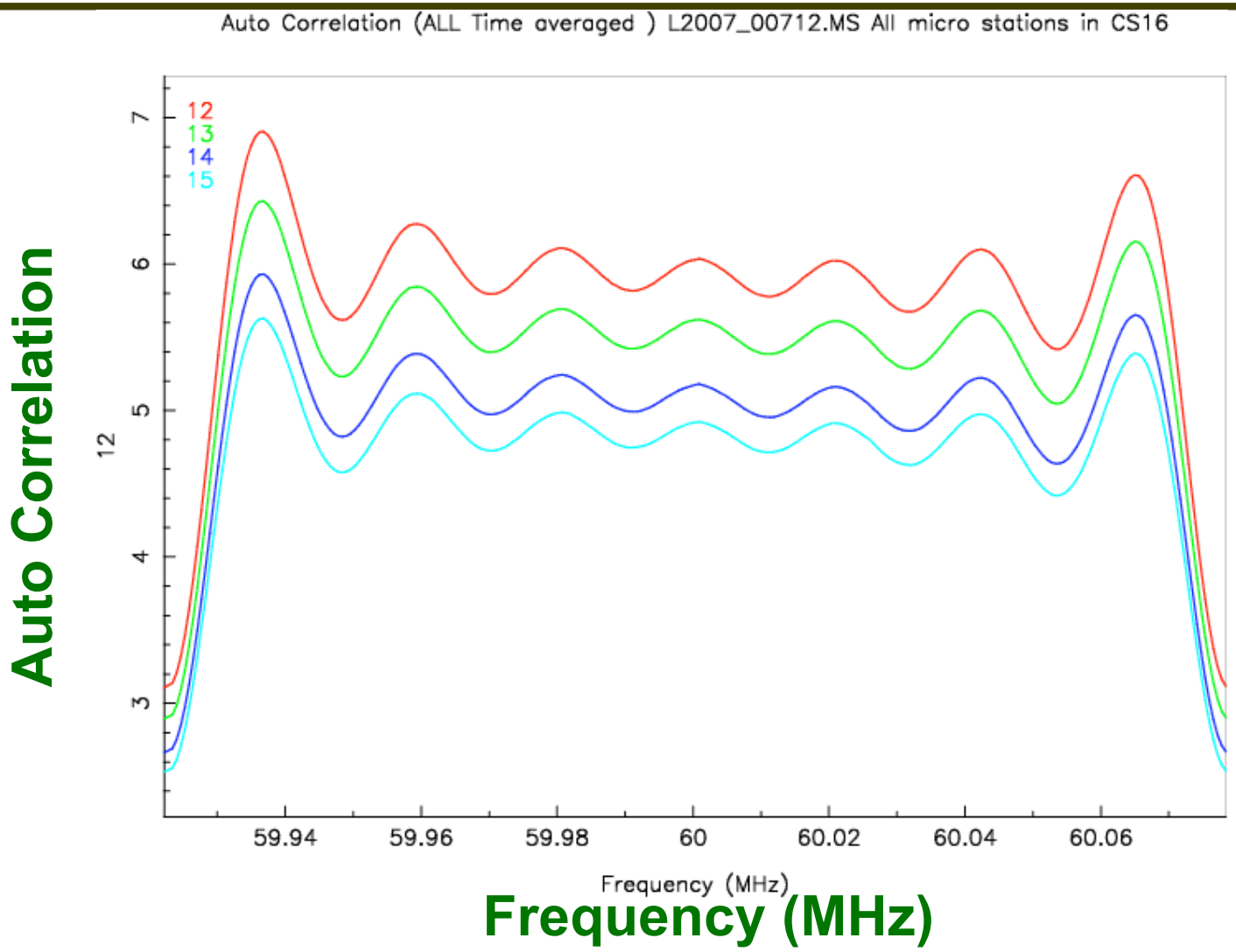
Auto Correlation (XX) (avg time) CS8



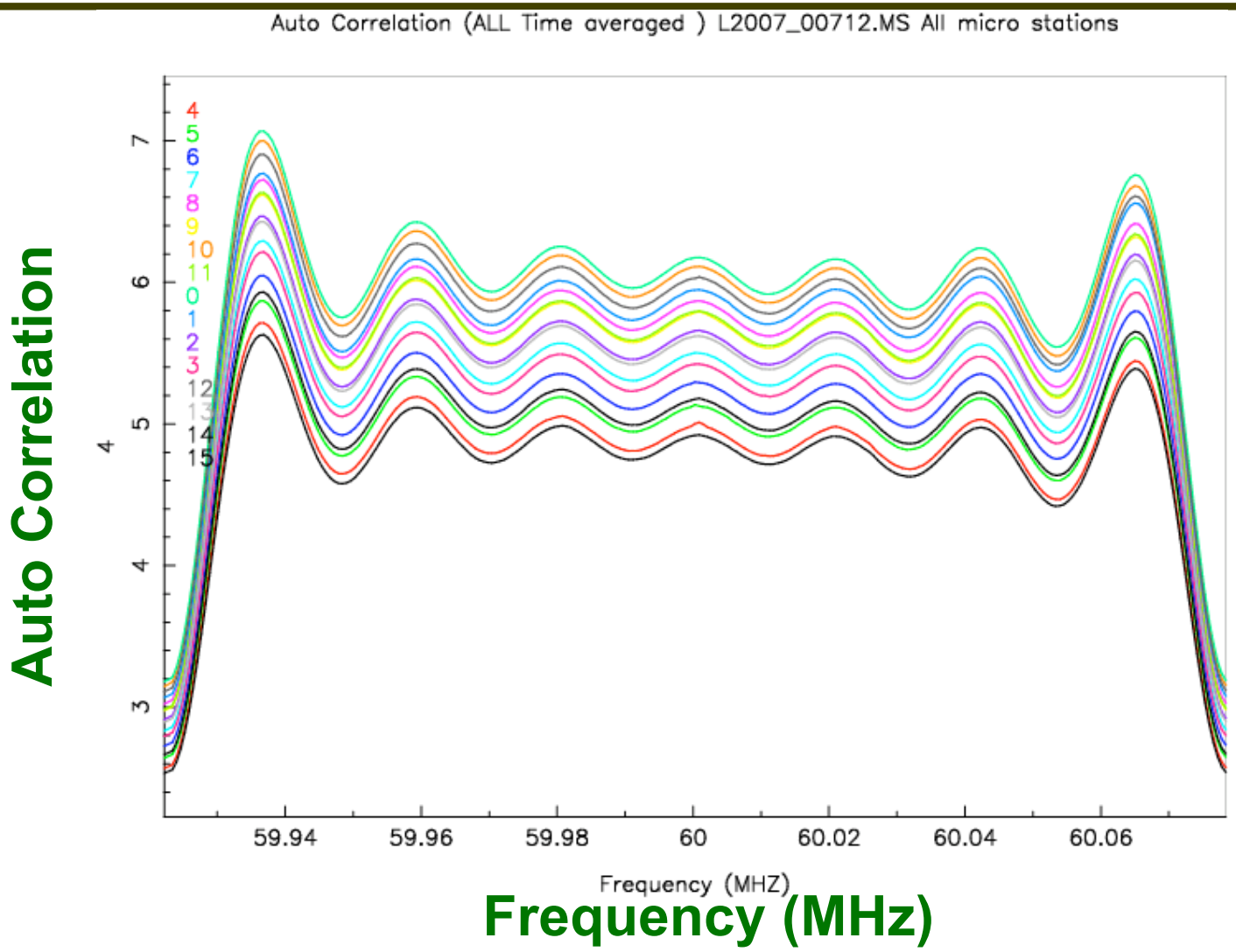
Auto Correlation (XX) (avg time) CS10



Auto Correlation (XX) (avg time) CS16



Auto Correlation (XX) (avg time) all mstns



Bandpass(time av eraged) on diff days: MStn1