

# The relation between the radio and gamma-ray emission in blazars

Walter Max-Moerbeck on behalf of the  
OVRO monitoring group

December 6, 2011

# Outline

- Constrain the site of gamma-ray emission by studying radio/gamma-ray cross-correlation
  - Large sample of radio blazars > 1600
    - Monitored by OVRO twice per week at 15 GHz
    - Data since 2008 for most sources and mid 2009 for 1LAC
    - 2LAC recently added
  - Sources monitored independently of gamma-ray state

# We have

- At least 3 years of radio data for 1LAC sources
- 4 years for the ones on CGRaBS
- Statistical methods to study significance of cross-correlations
- First results to be presented on a paper in preparation
  - Data from OVRO and first blazar variability paper (Cat III paper)

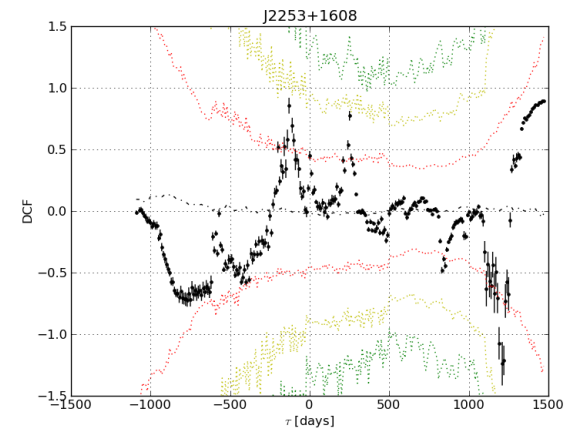
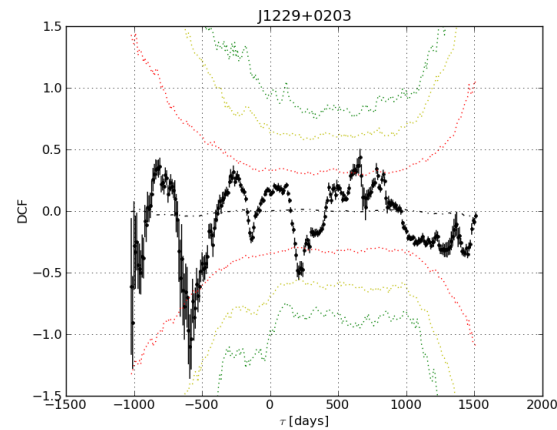
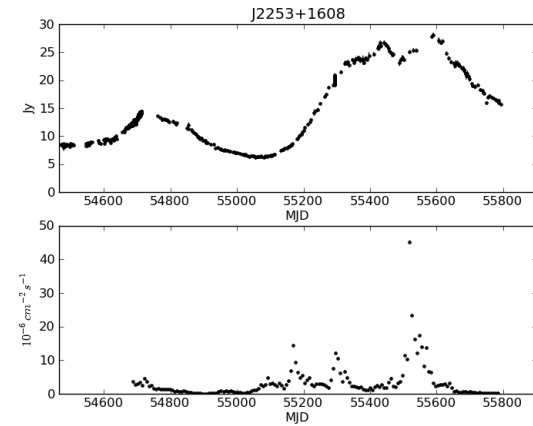
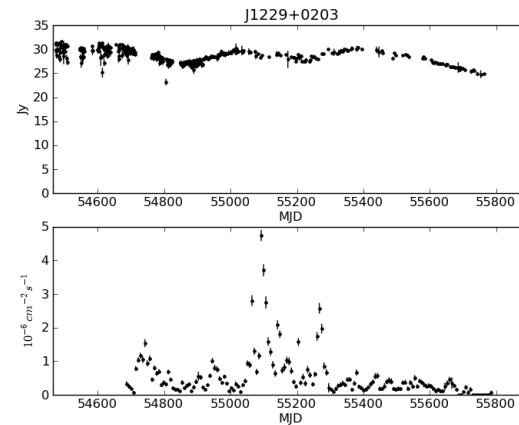
# This project – Cat II paper

- Extraction of 3 year long light curves for bright Fermi objects ( $\sim 100$ ) (T. Hovatta is doing this)
  - Might use special cadence to match OVRO, better for brighter sources, etc => We need some control over these parameters
  - Idea is to coordinate light curve and other analyses with variability paper. Many common issues
- Characterizing power spectral density for radio and gamma-rays
- Estimating significance of cross-correlations, and measuring time lags when significant

# Example light curves

Examples light curves and significance contours using reference parameters for PSD

An important part of the project is to characterize the PSDs to use best values



# Summary

- Need approval for a couple preliminary light curves to show at AAS, thesis talk W. Max-Moerbeck. **By Jan 9, 2012**
- Graduation date of June 2012 sets timeline for project
- Some aspects will be coordinated with blazar variability paper