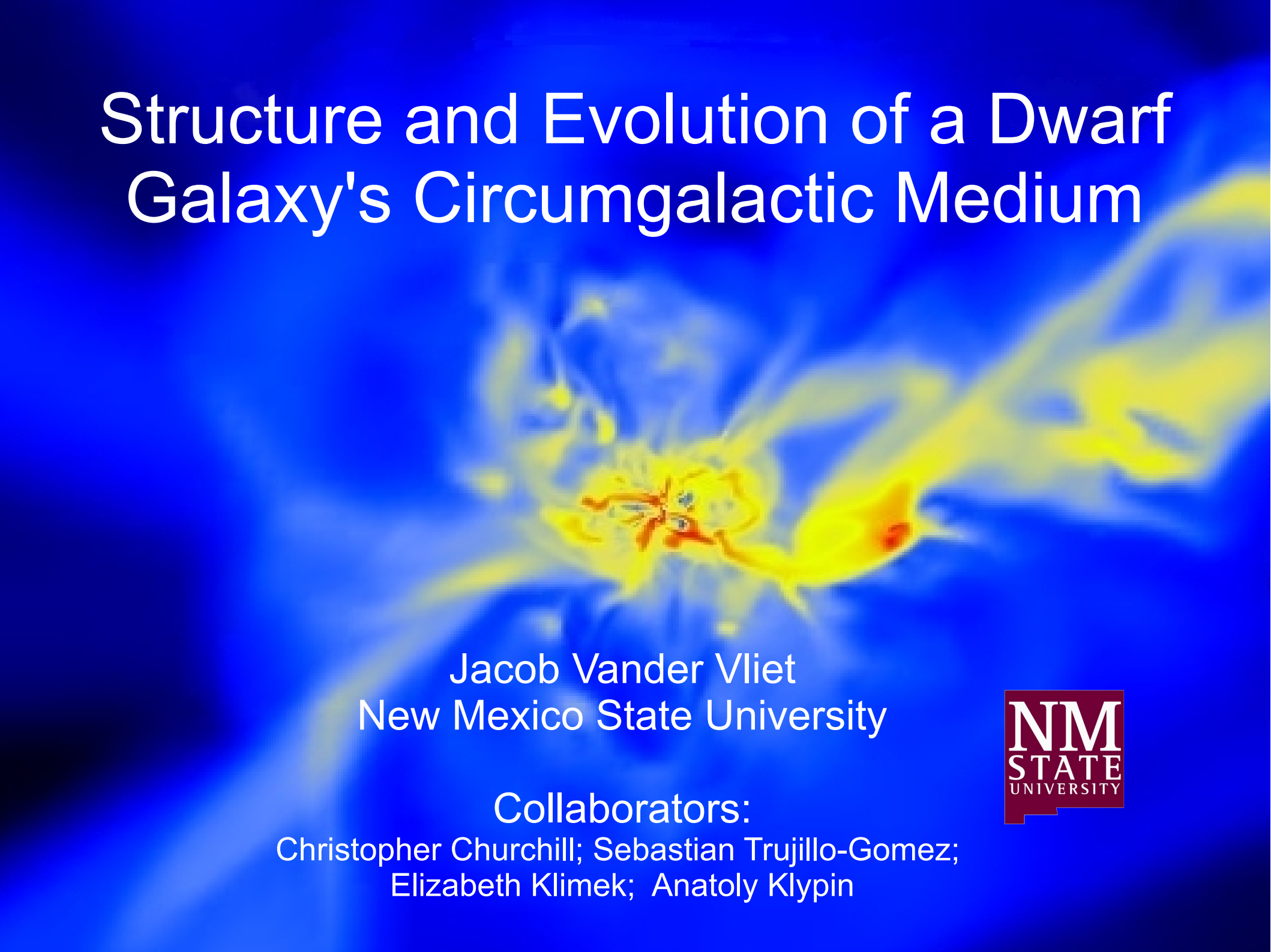
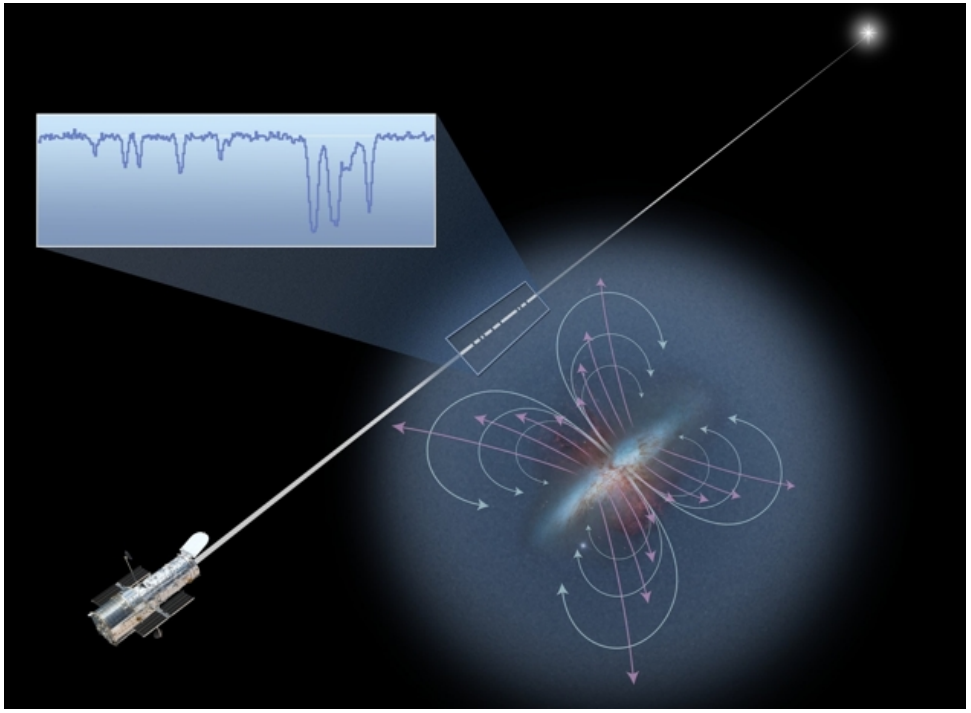
Structure and Evolution of a Dwarf Galaxy's Circumgalactic Medium



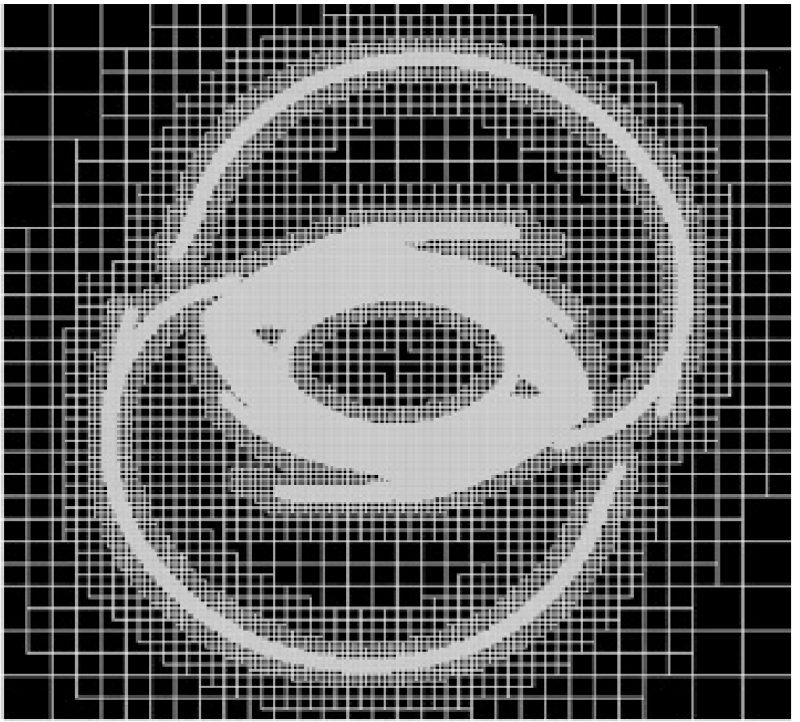
Jacob Vander Vliet
New Mexico State University

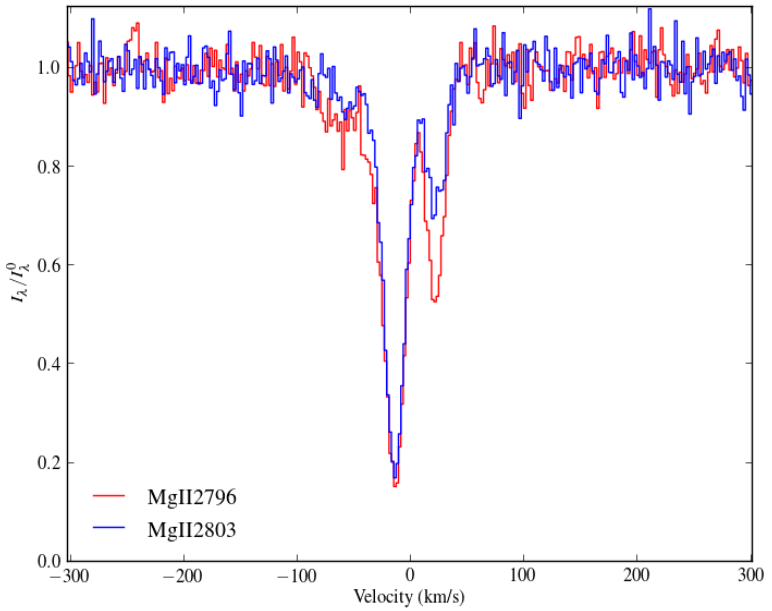
Collaborators:
Christopher Churchill; Sebastian Trujillo-Gomez;
Elizabeth Klimek; Anatoly Klypin

- Motivation
  - Circumgalactic medium is interface between ISM and IGM
  - CGM plays a major role in galaxy evolution
  - Contains history of accretion and star formation
  - Observed with quasar absorption lines
  - Use simulations to help interpret observations
  - Examining the halos of simulated galaxies is a test of the subgrid physics



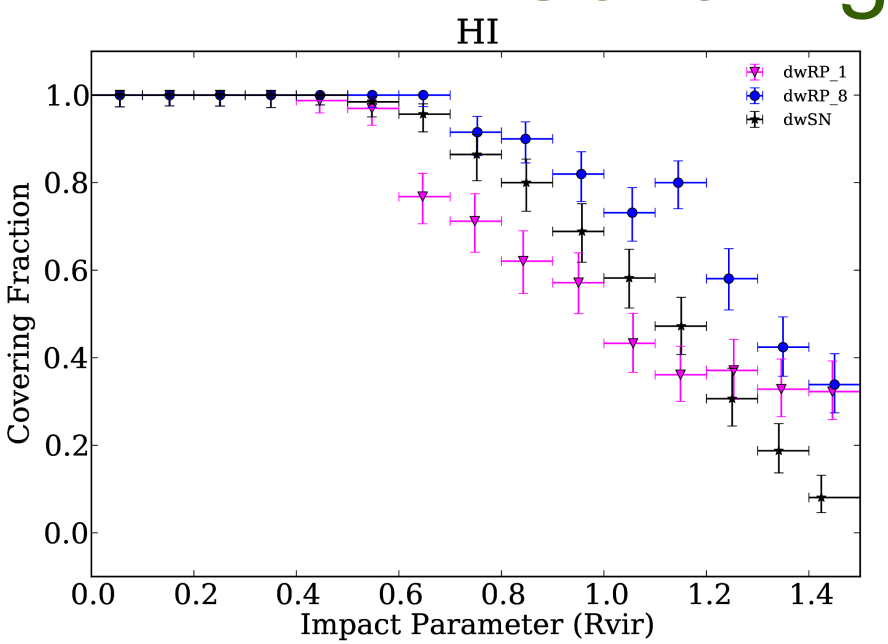
- Methods
  - Examine the halos of a dwarf galaxy simulated with ART
  - Cosmological zoom-in
  - Each galaxy is simulated thrice with differing stellar feedback models
    - dwSN: Supernova only
    - dwRP_1: Add weak radiation pressure
    - dwRP_8: Add strong radiation pressure

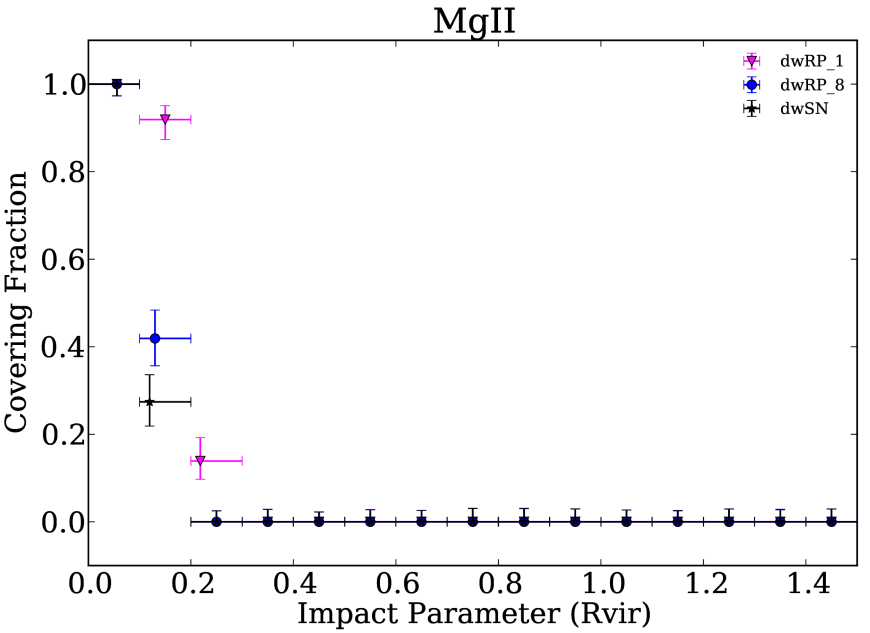


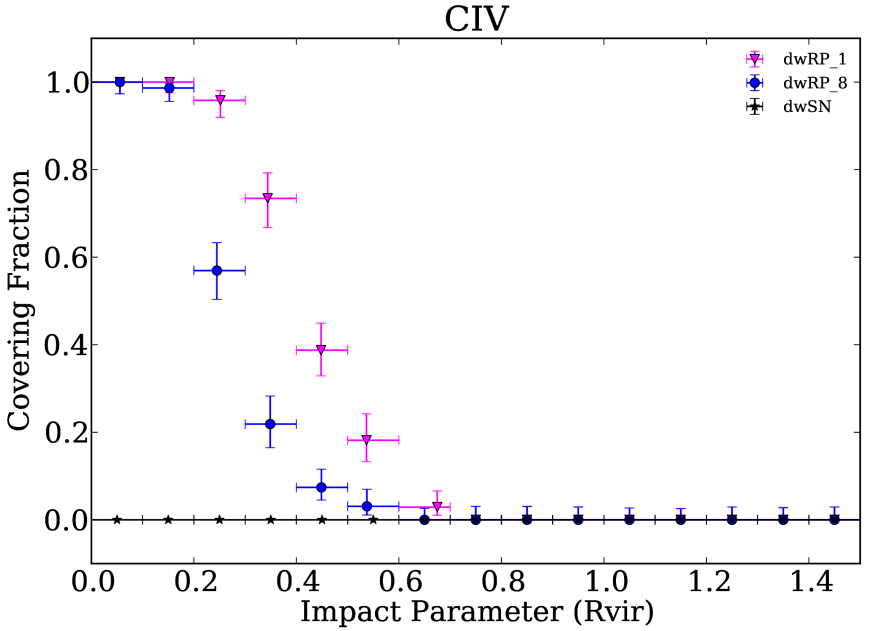


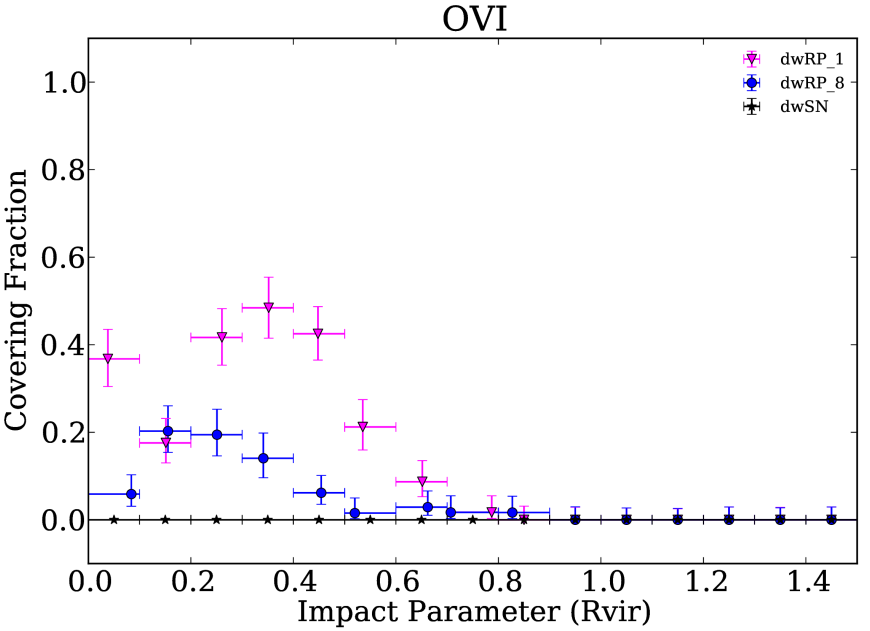
  - Generate quasar absorption profiles by running lines of sight through the halos, applying instrumental affects
  - Analyze using observer's tools
  - Focus on HI, MgII, CIV, OVI
  - Compare the models at z=0
  - Follow dwRP_8 as it undergoes a starburst

Feedback Comparison:
Covering Fraction



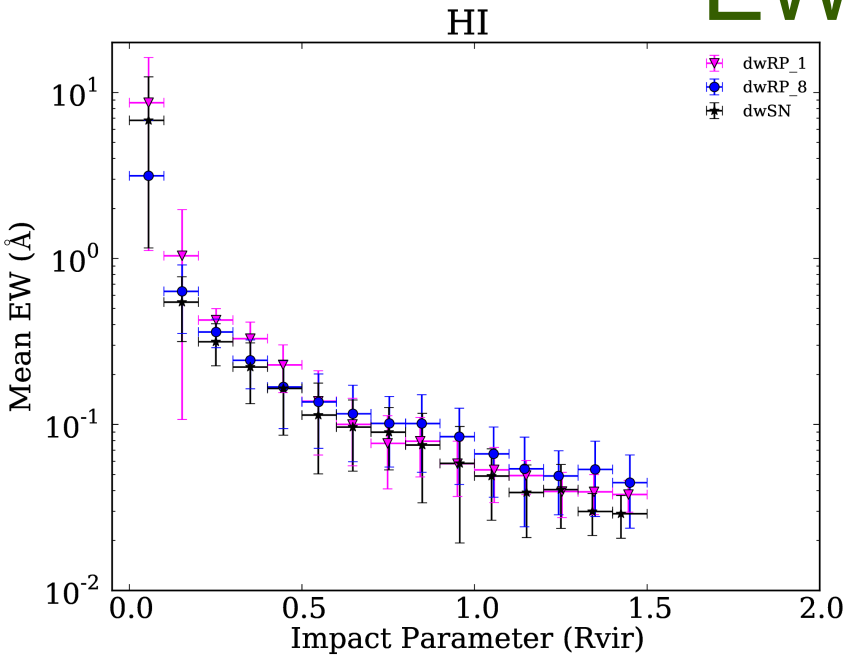


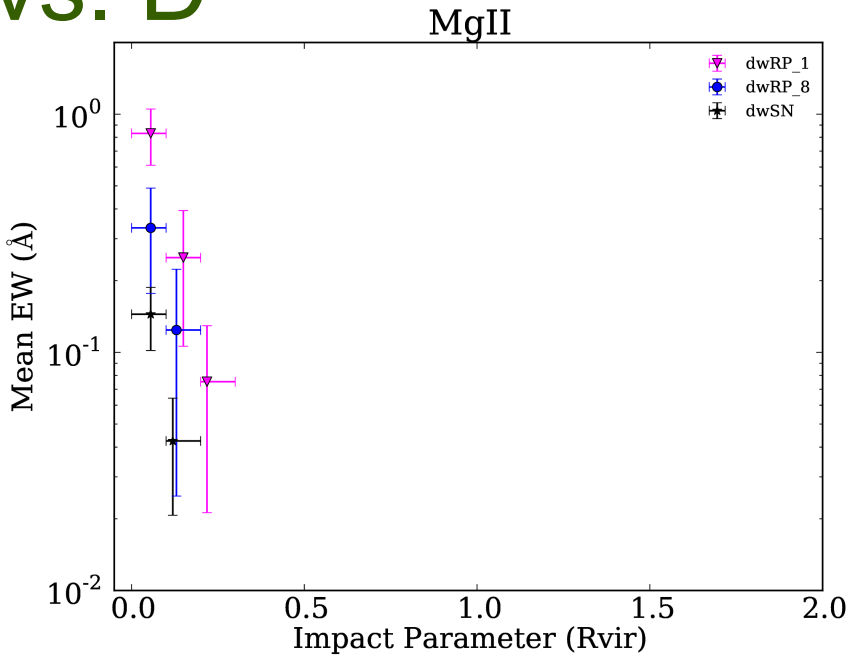


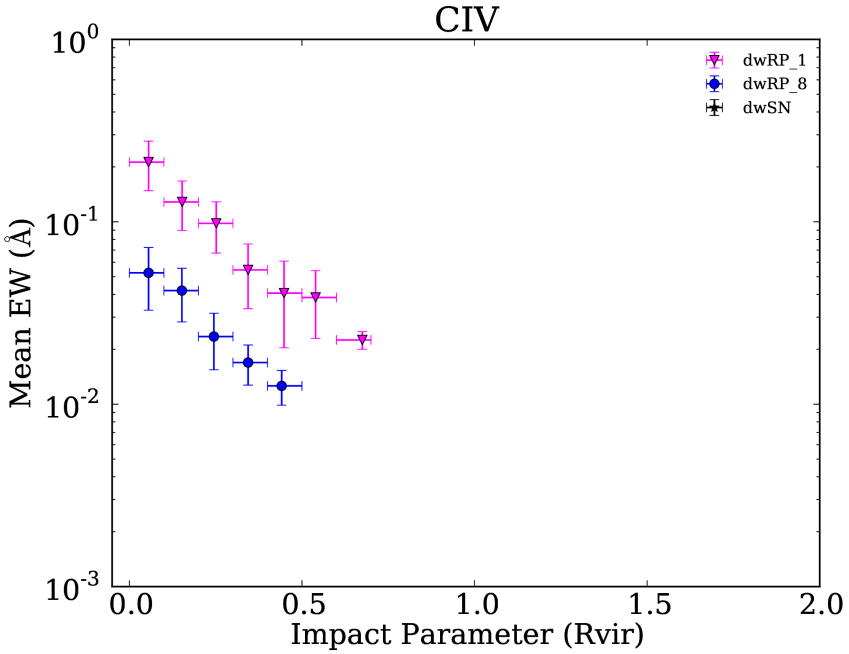


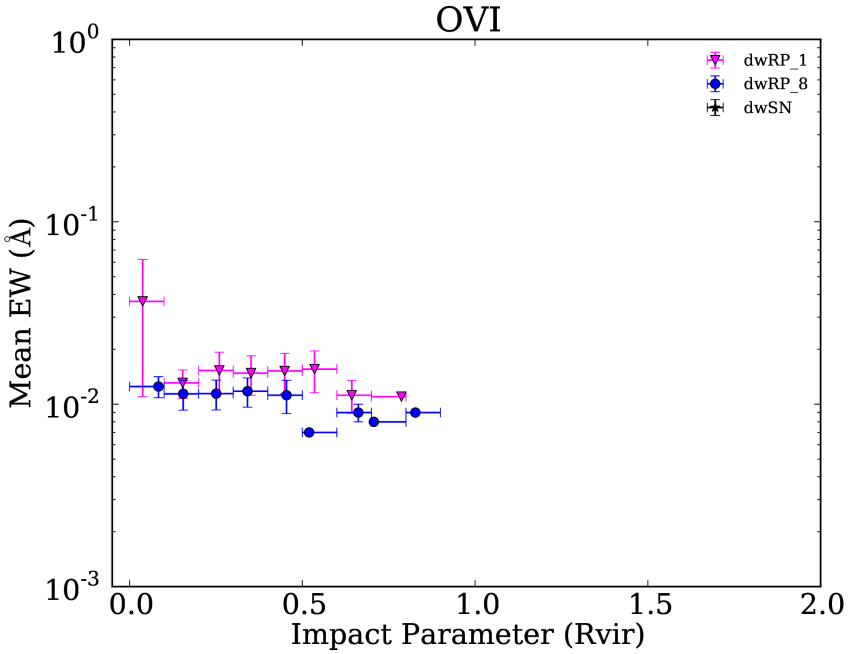
Feedback Comparison:

EW vs. D

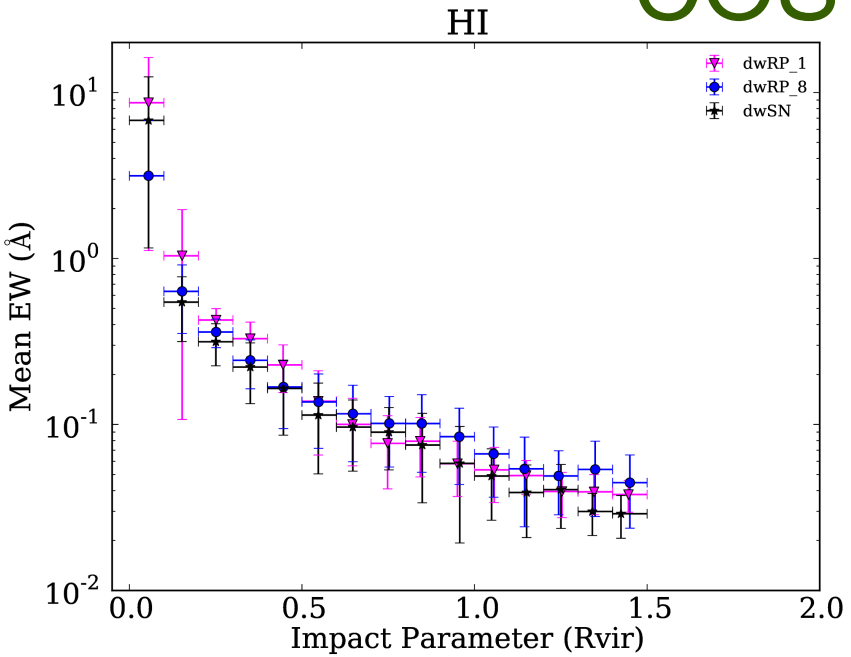


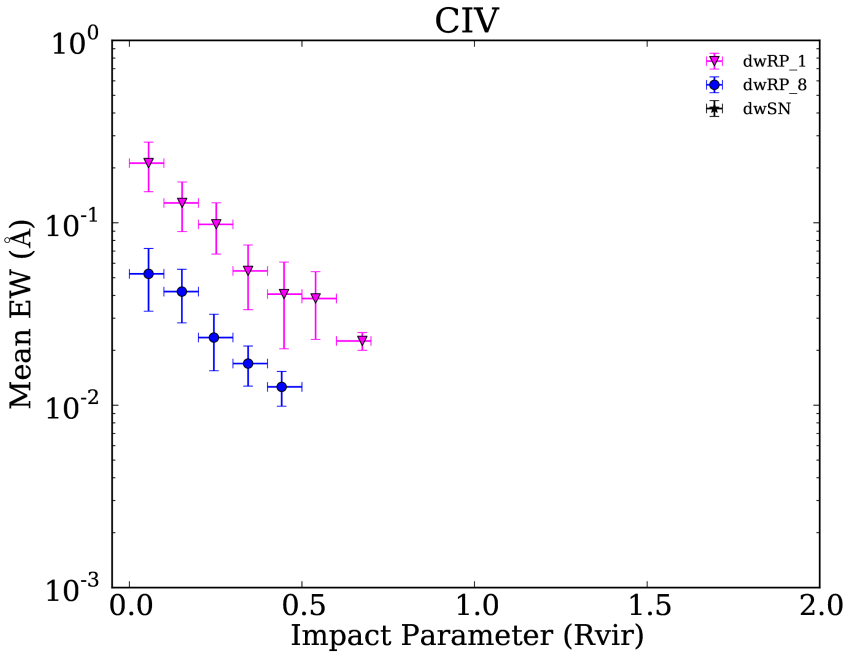


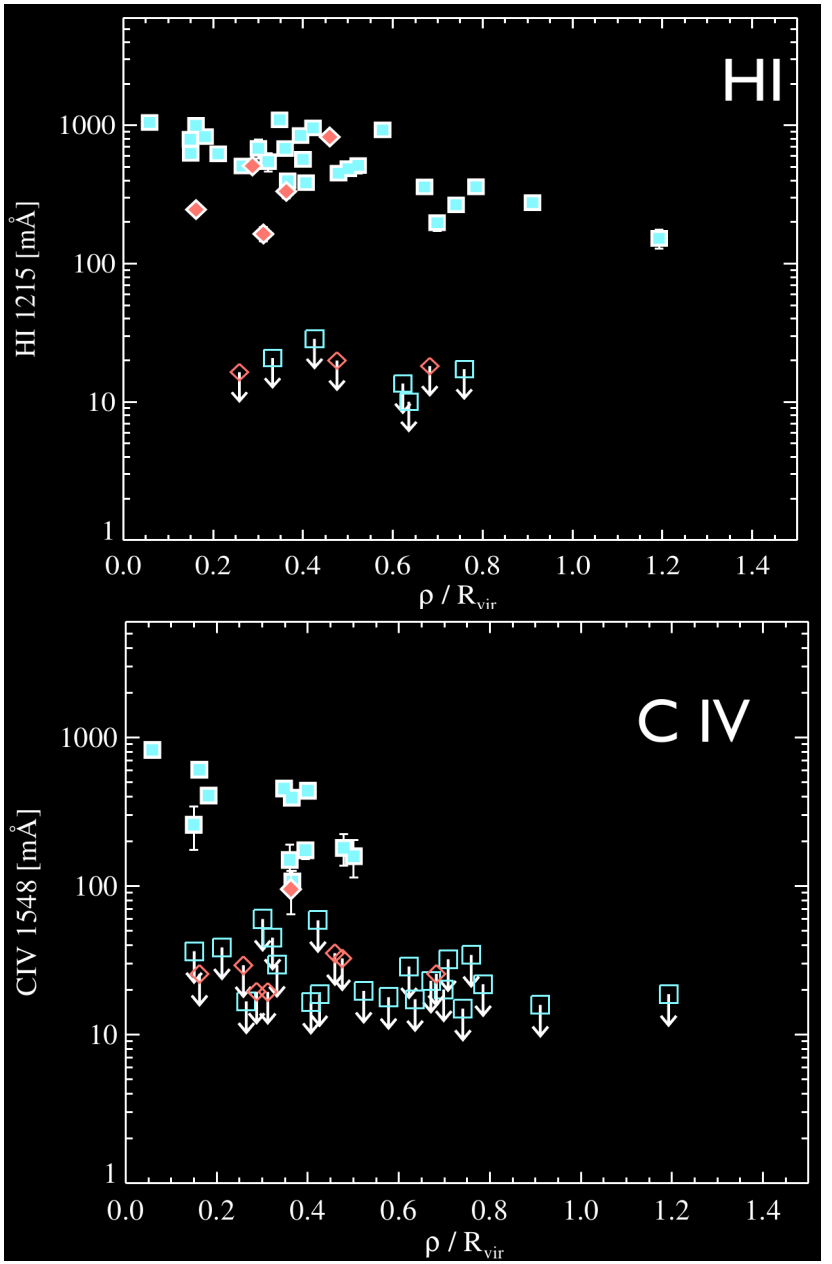




Observations:
COS-Dwarfs

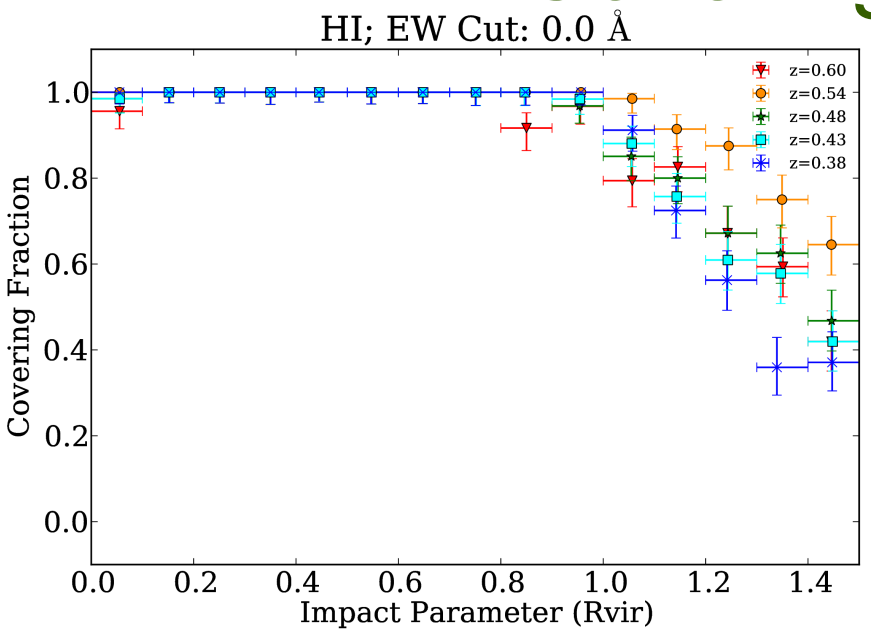


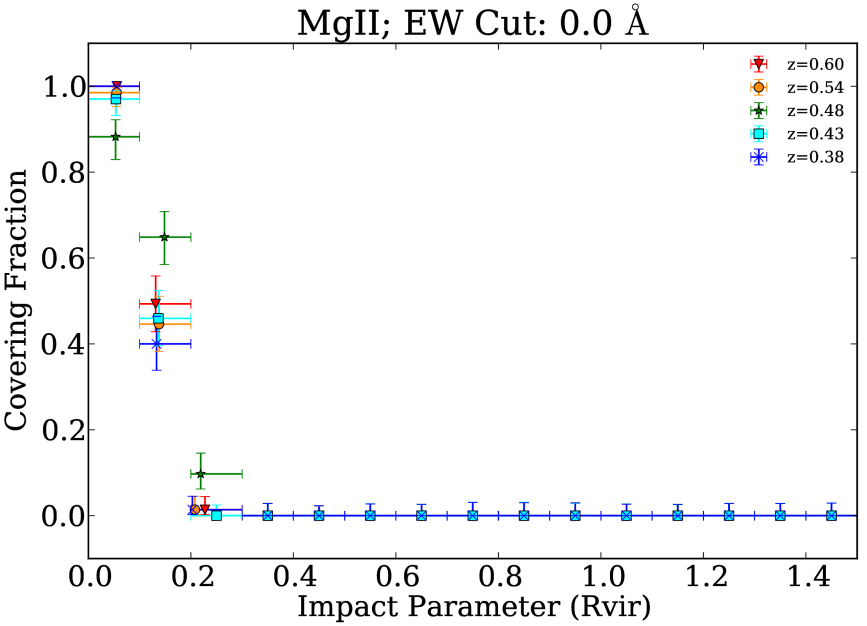


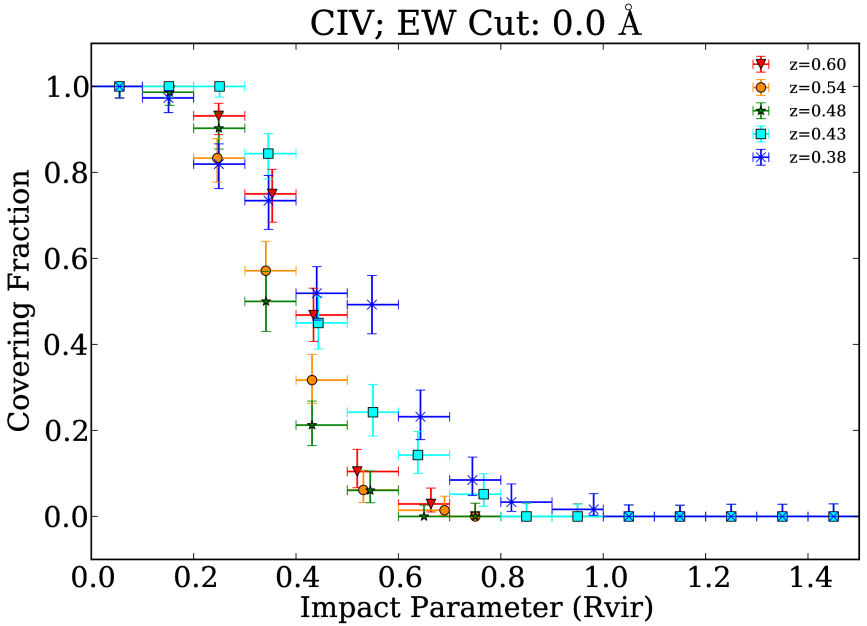


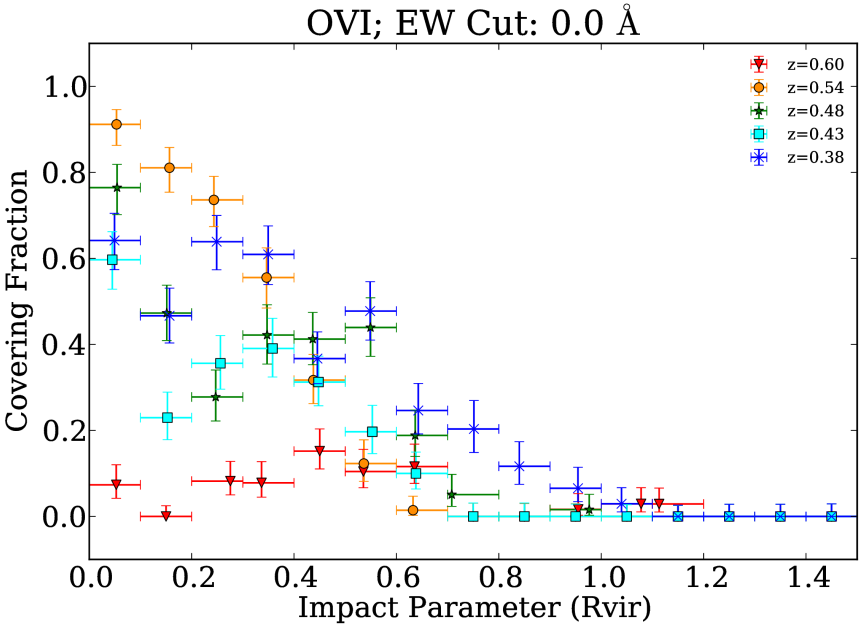
Bordoloi et al, AAS Proceedings

Starburst:
Covering Fraction

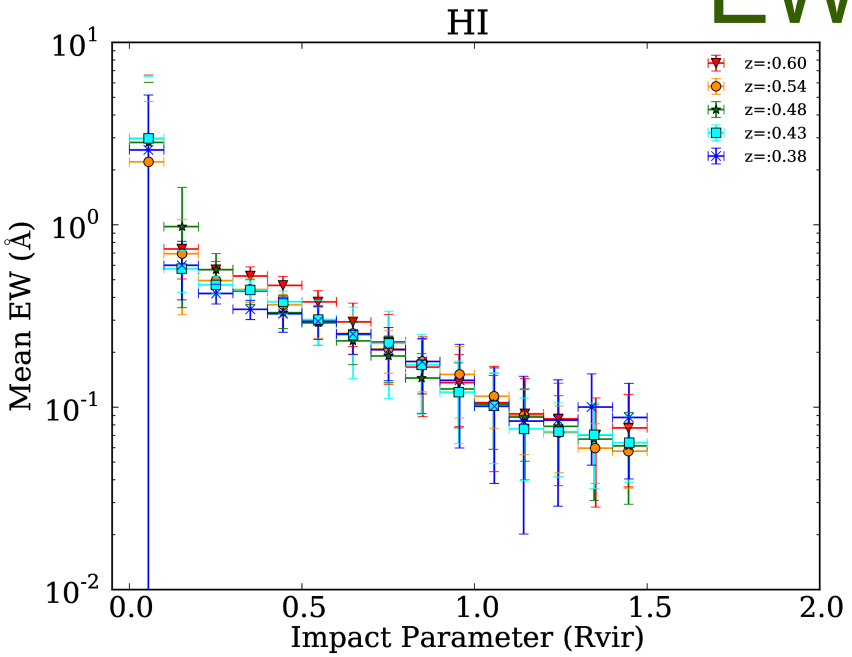


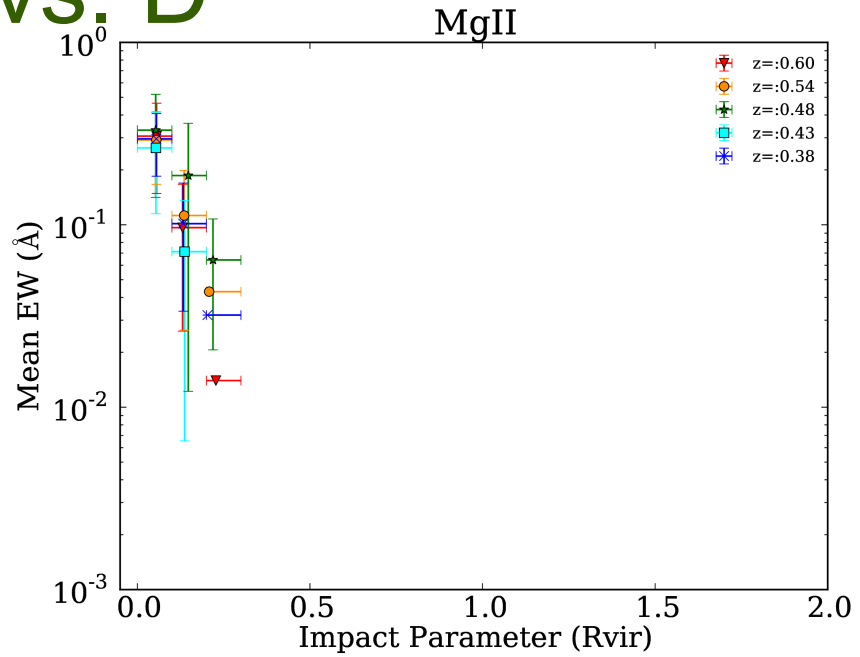


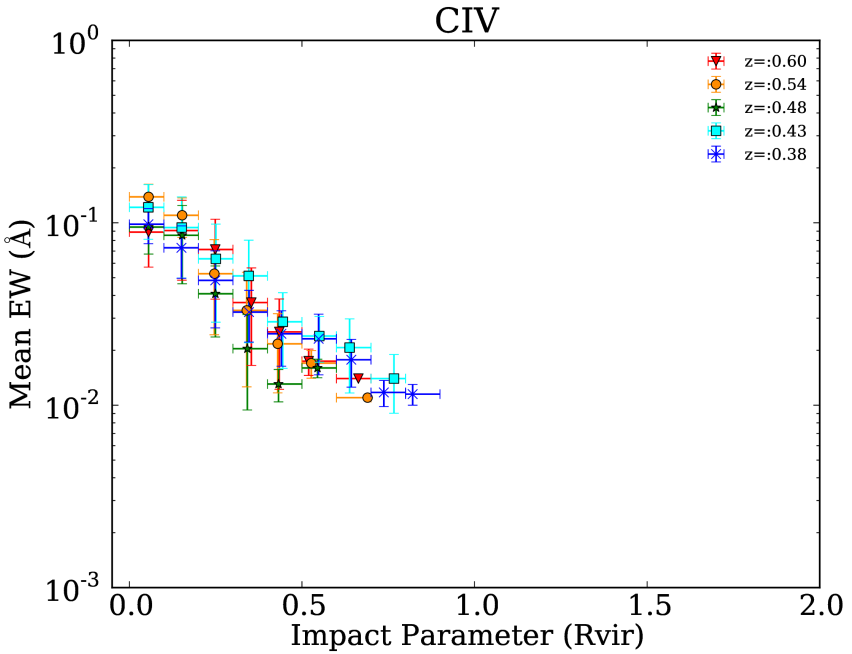


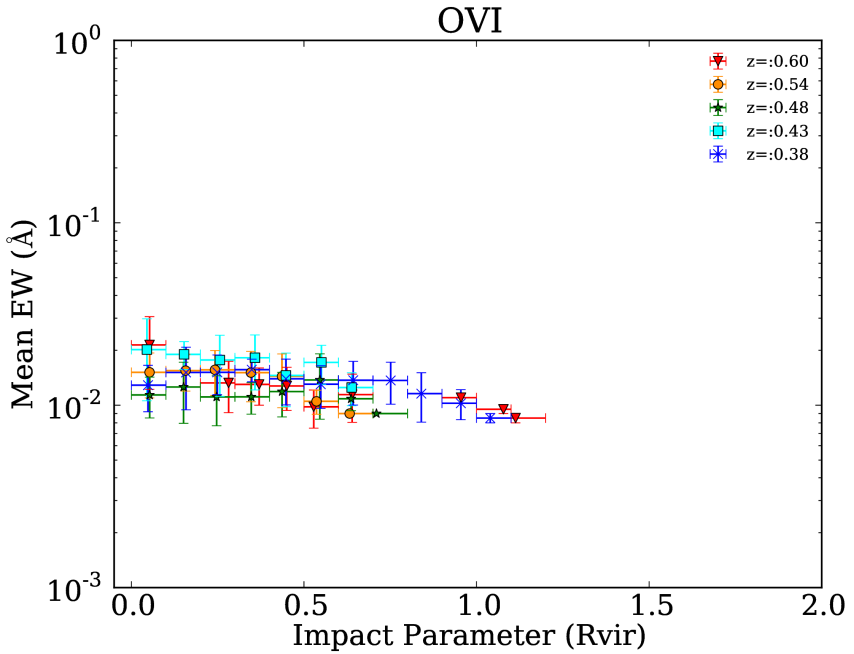


Starburst:
EW vs. D



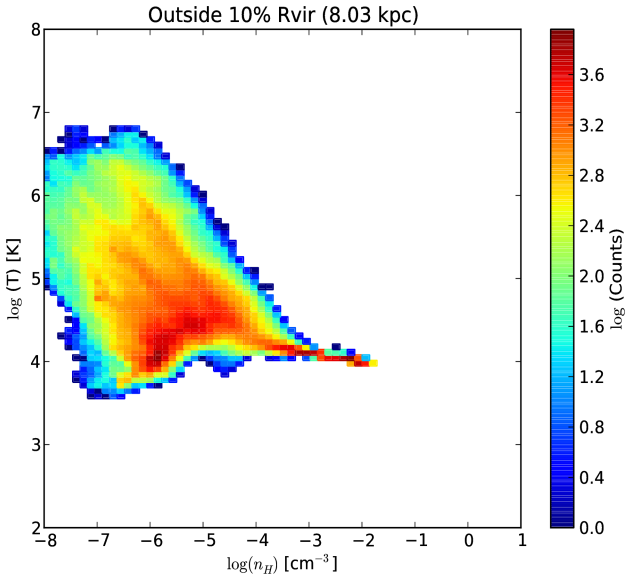




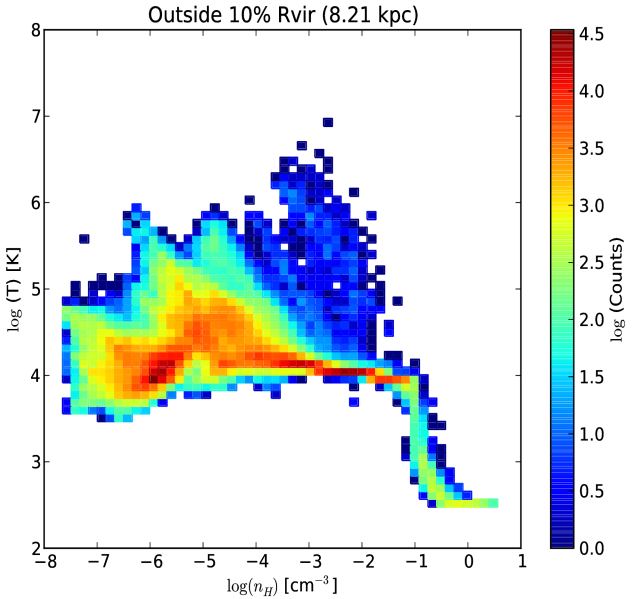


Summary

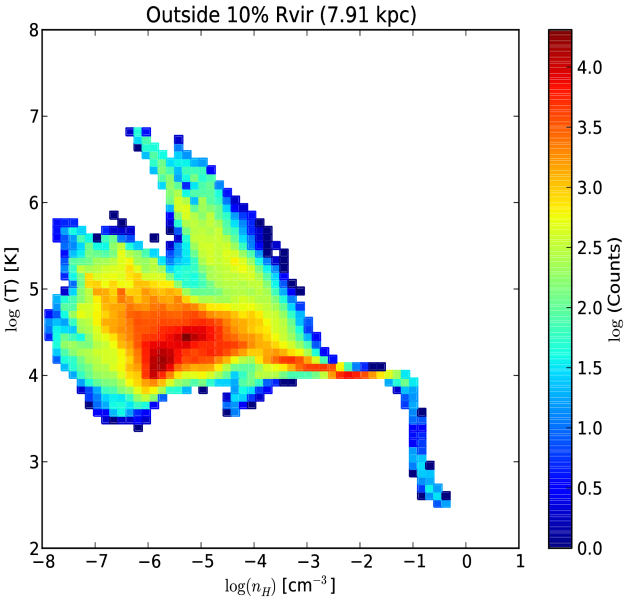
- Need radiation pressure to get metals detection in the CGM of present-day dwarfs
- CGM phase properties are sensitive to radiation pressure
- OVI unobservable
- Bursts in star formation do not affect the properties of an absorption feature, only the probability of observing it.



dwSN



dwRP_1



dwRP_8