“Light curves” observed on meteor-head radar returns from Jicamarca: Preliminary Results

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2011 CEDAR – El Dorado, Santa Fe, NM

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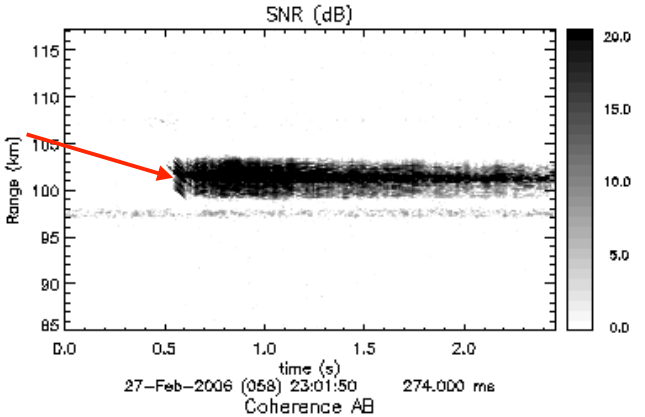
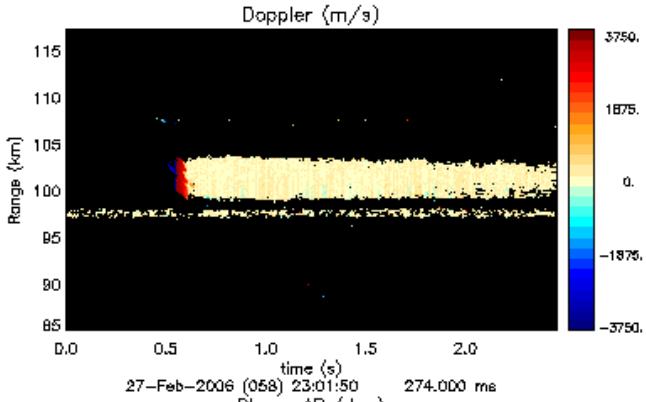
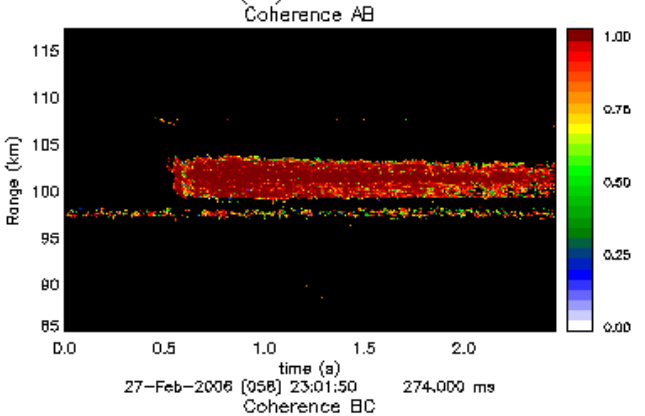
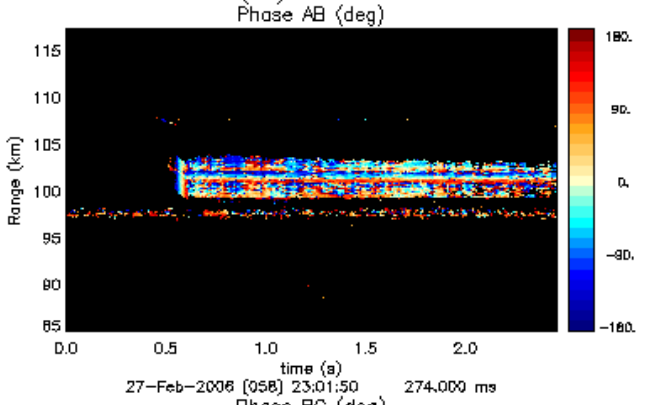
3) Modeling Fluctuations in SNR
4) Conclusions

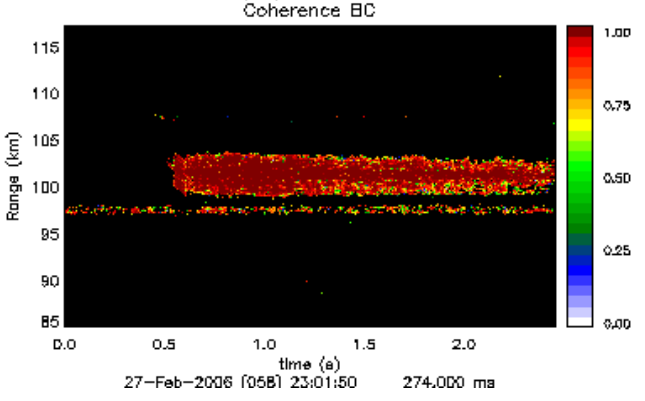
1) Light Curves at Jicamarca: Smooth Curves

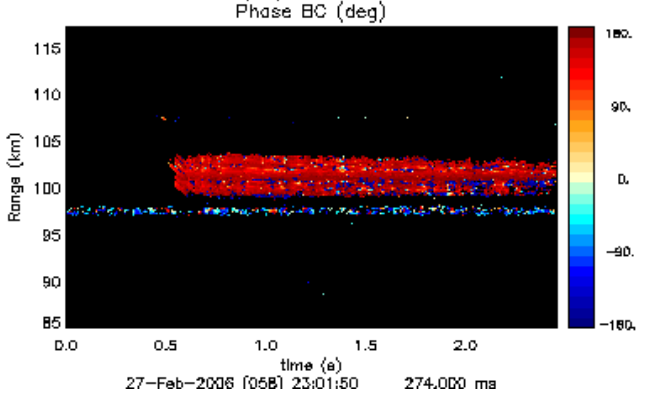


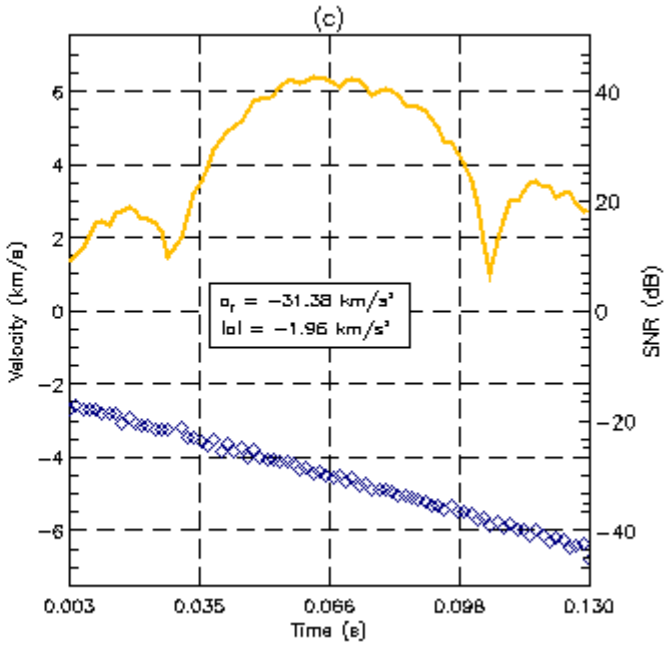








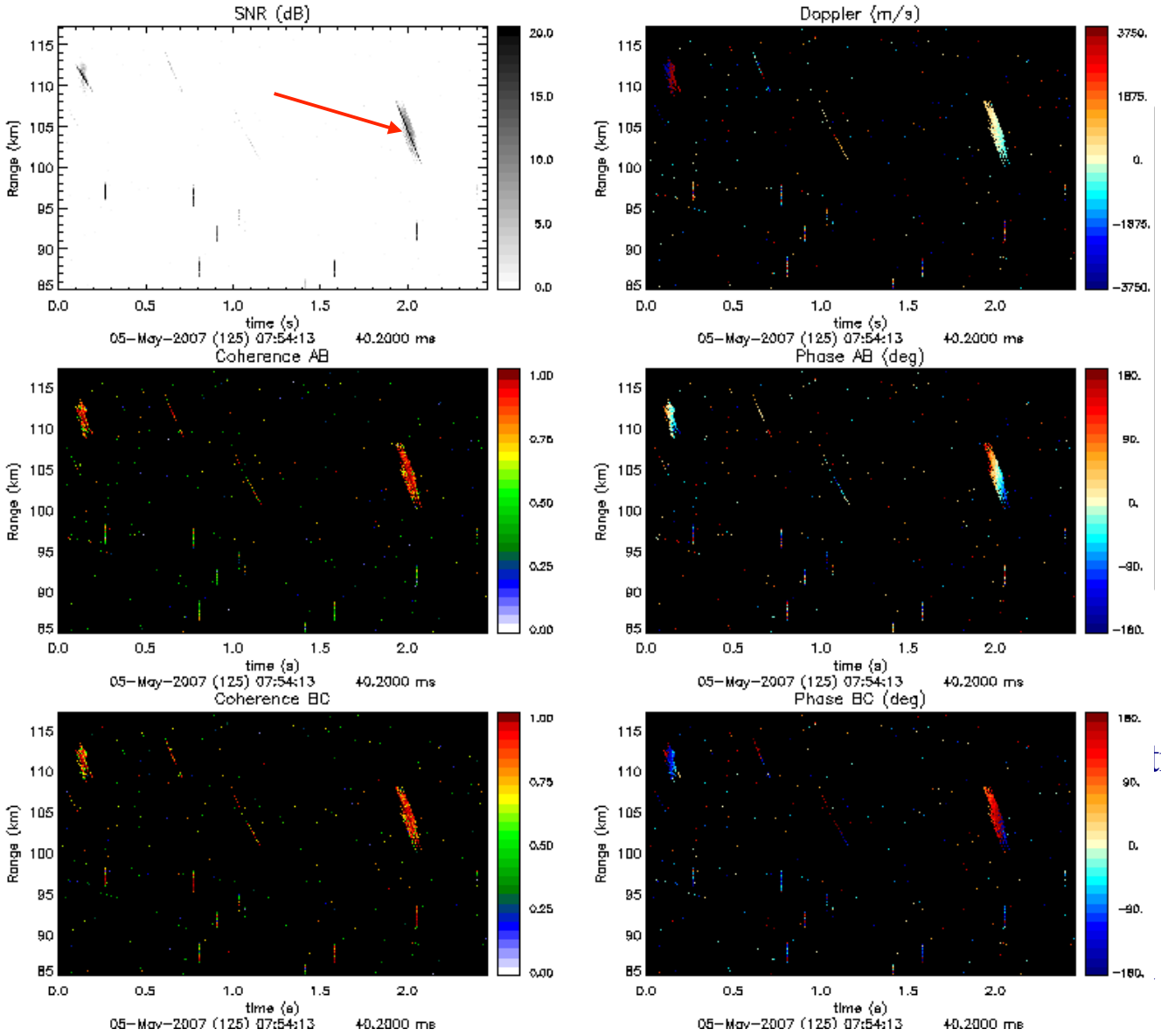


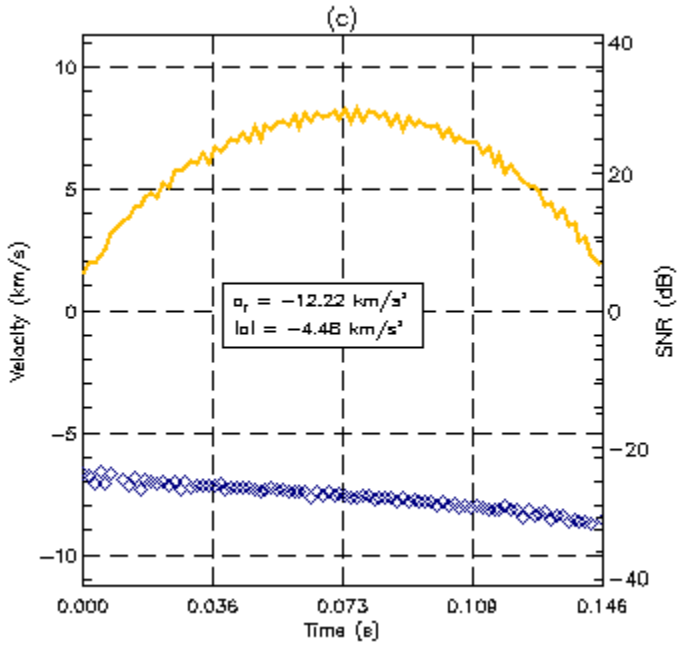


ectory of the meteor in the radar meteor trajectory (in orange).

Fe, NM

1) Light Curves at Jicamarca: Smooth Curves

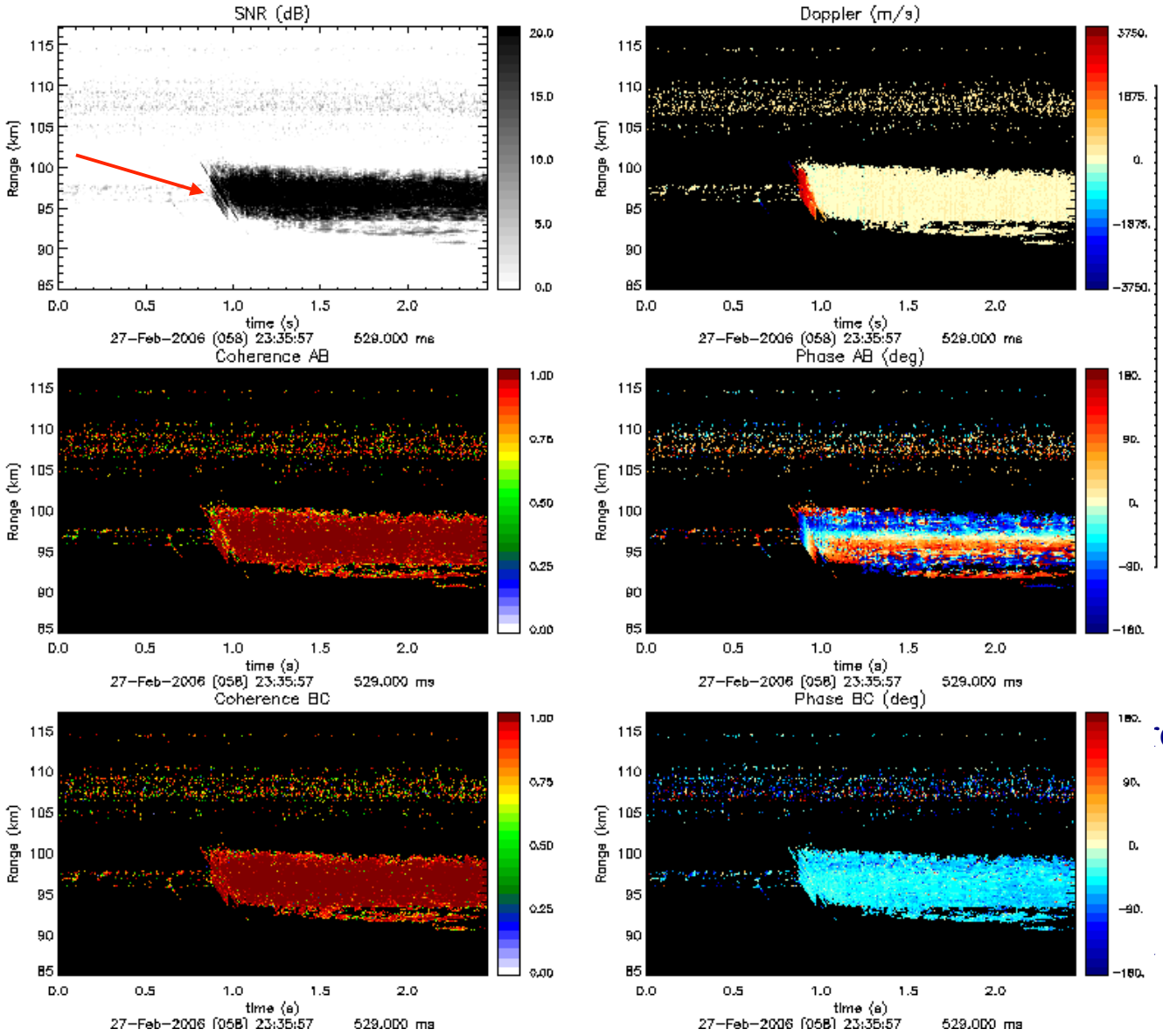


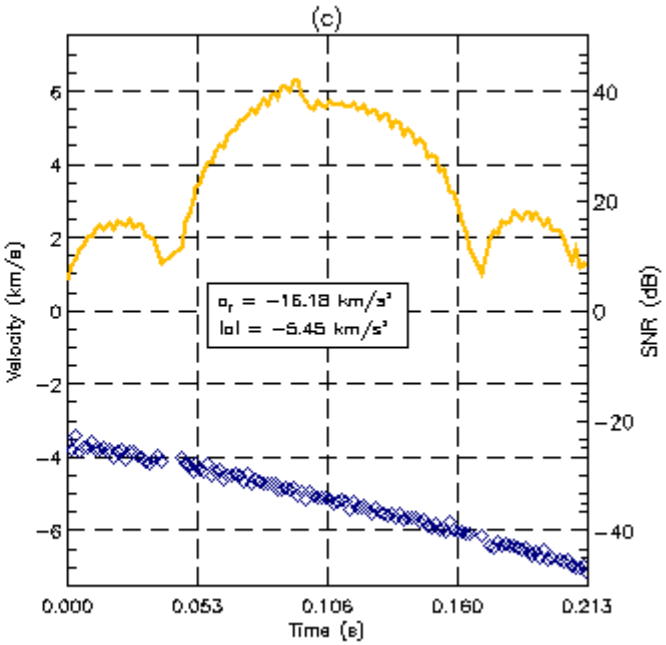


traveling on the main beam

Fe, NM

1) Light Curves at Jicamarca: Sudden Changes

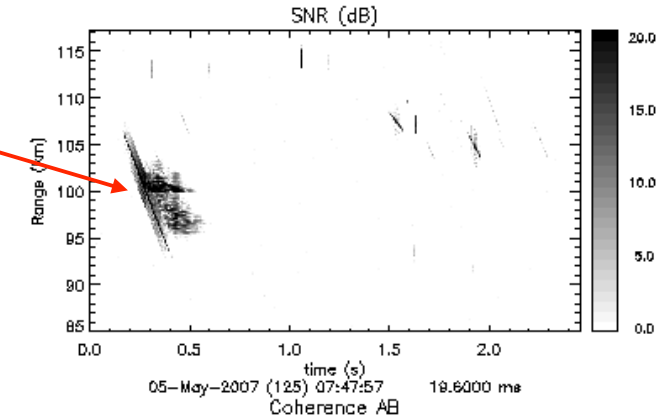


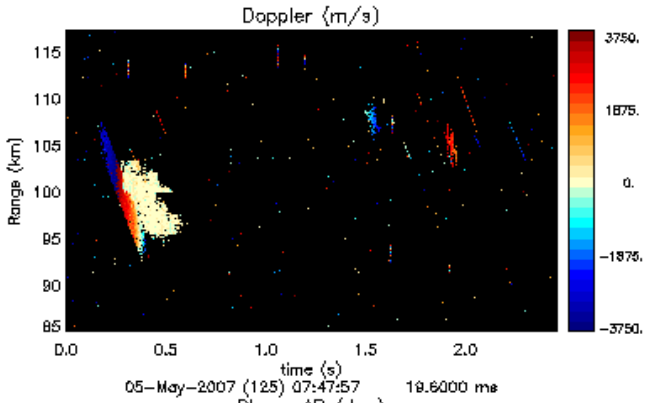


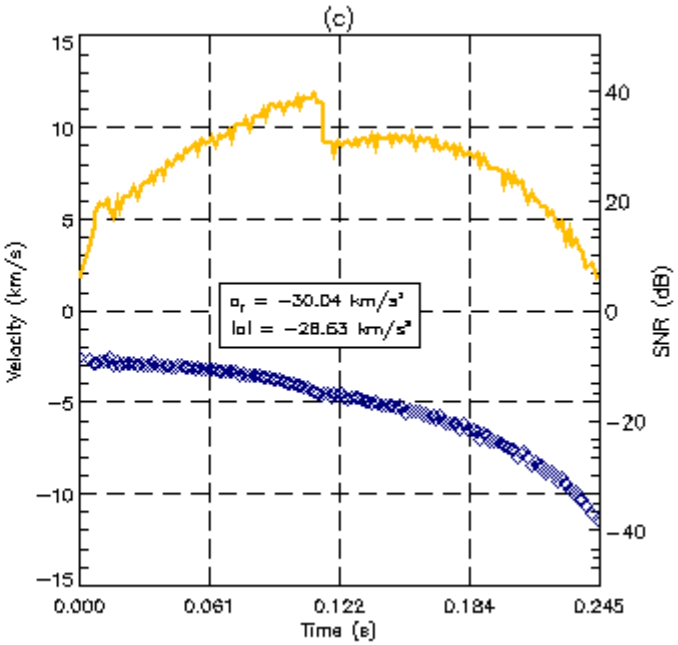
ease in SNR

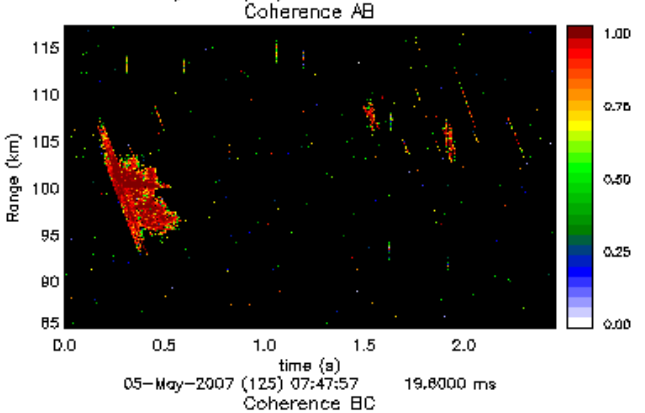
Fe, NM

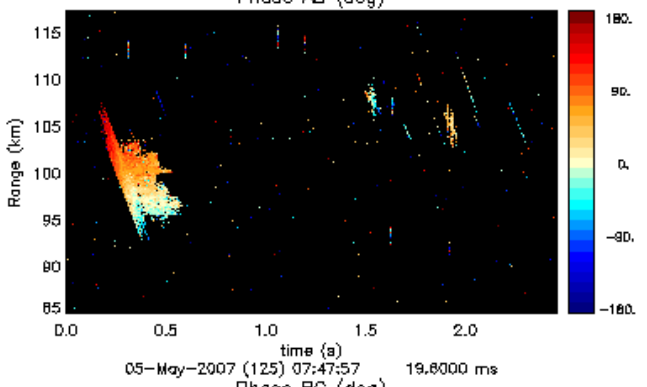
1) Light Curves at Jicamarca: Sudden Changes

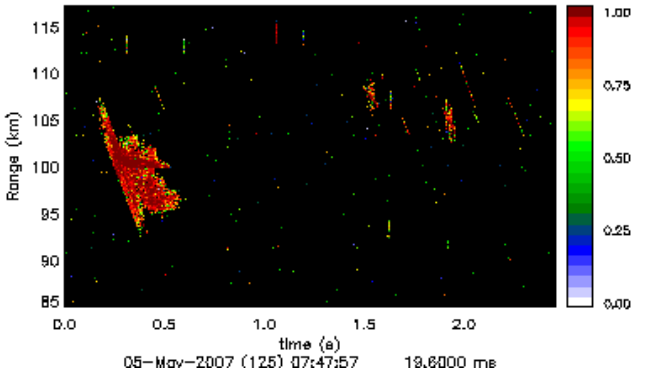


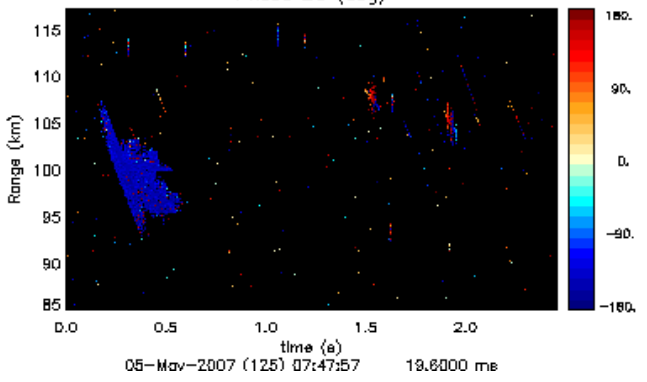








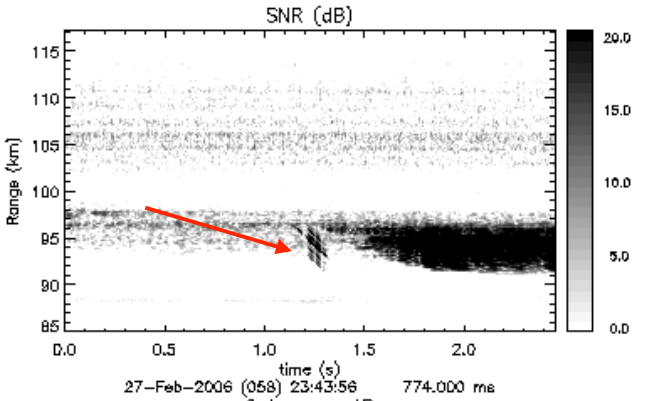


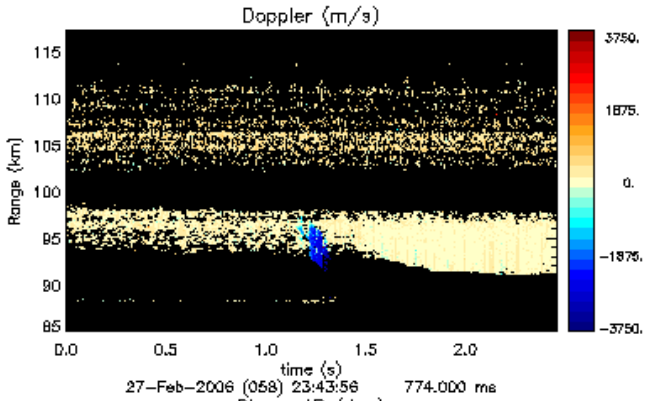


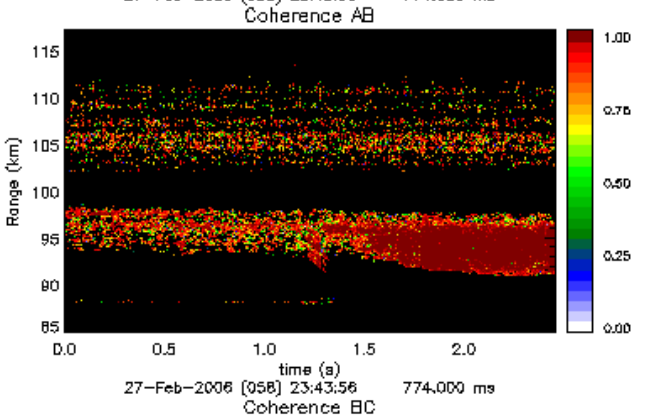
ease in SNR

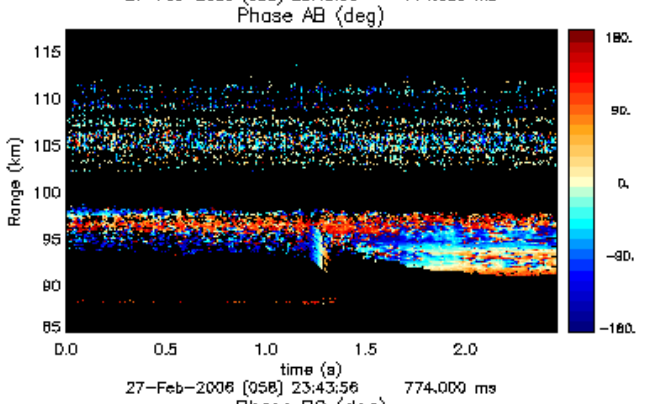
Fe, NM

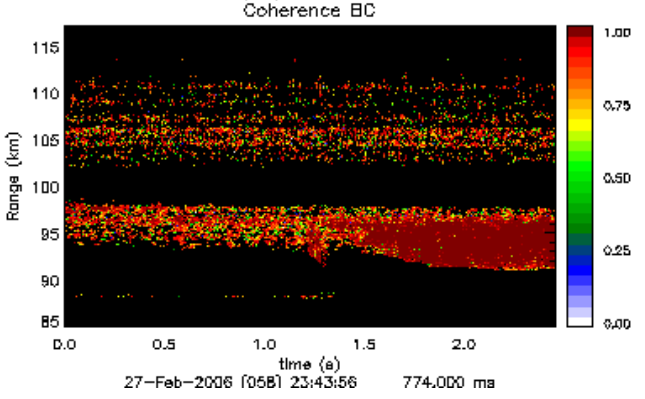
1) Light Curves at Jicamarca: Fluctuations

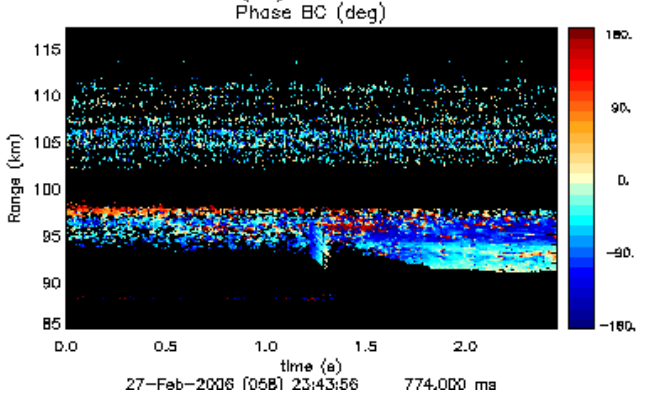


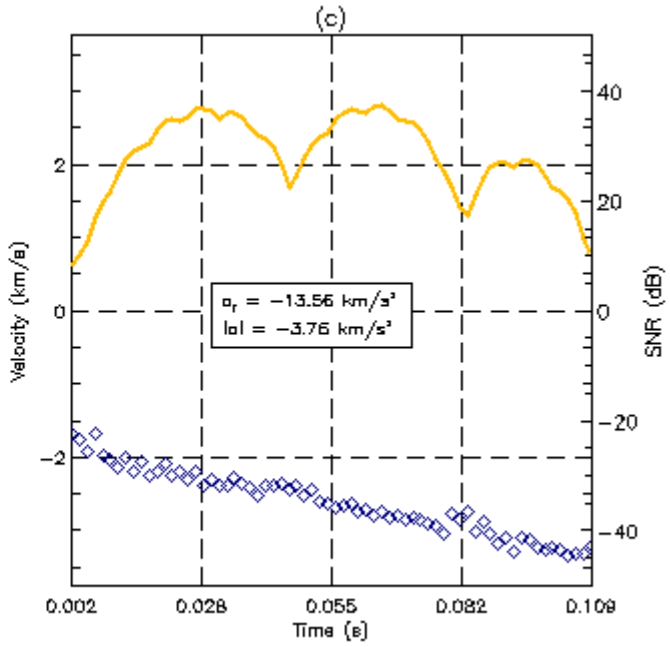








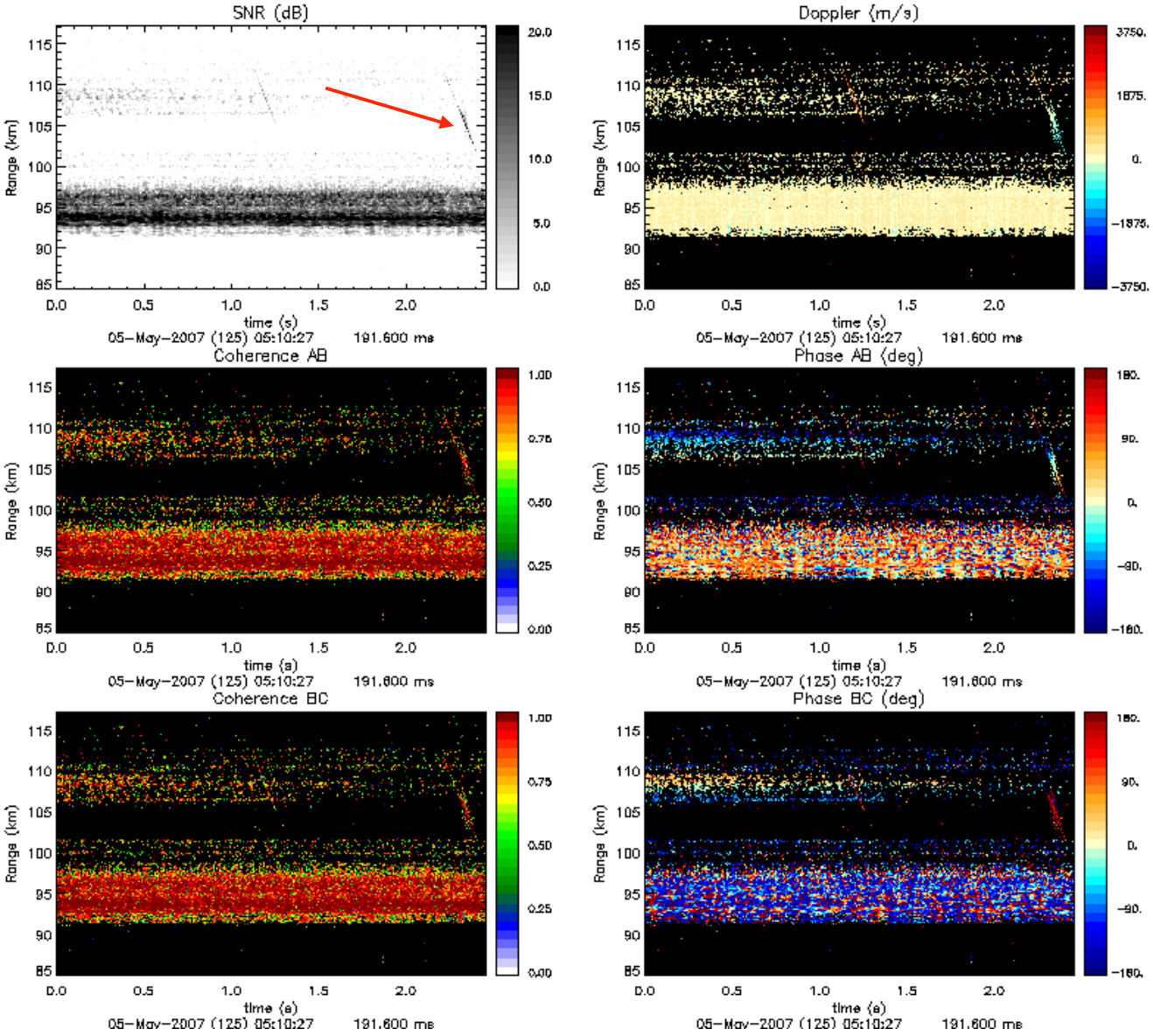


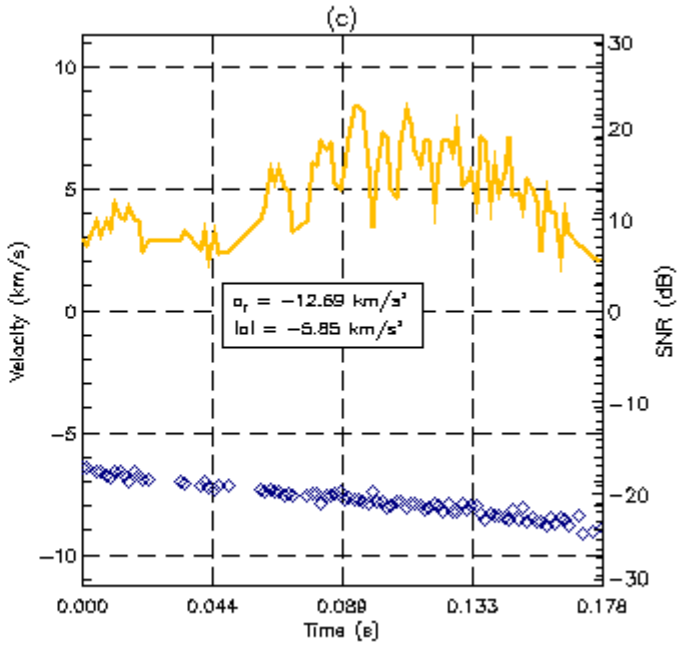


ıs in SNR

Fe, NM

1) Light Curves at Jicamarca: Fluctuations





ıs in SNR

Fe, NM

2) Statistical Analysis of "Light Curves"

- We looked over meteor-head data from:
  - 27 Feb 2006 (~15:00-24:00 hrs LT) (1808 events)
  - 05 May 2007 (~04:00-08:00 hrs LT) (16914 events)

- "Light Curves" – Number of Events

Date	Simple Ablation	Differential Ablation	Fragmentation?
27 Feb 2006	**180 (9.95%)**	**45 (2.49%)**	**130 (7.19%)**
05 May 2007	**717 (4.23%)**	**781 (4.62%)**	**868 (5.13%)**

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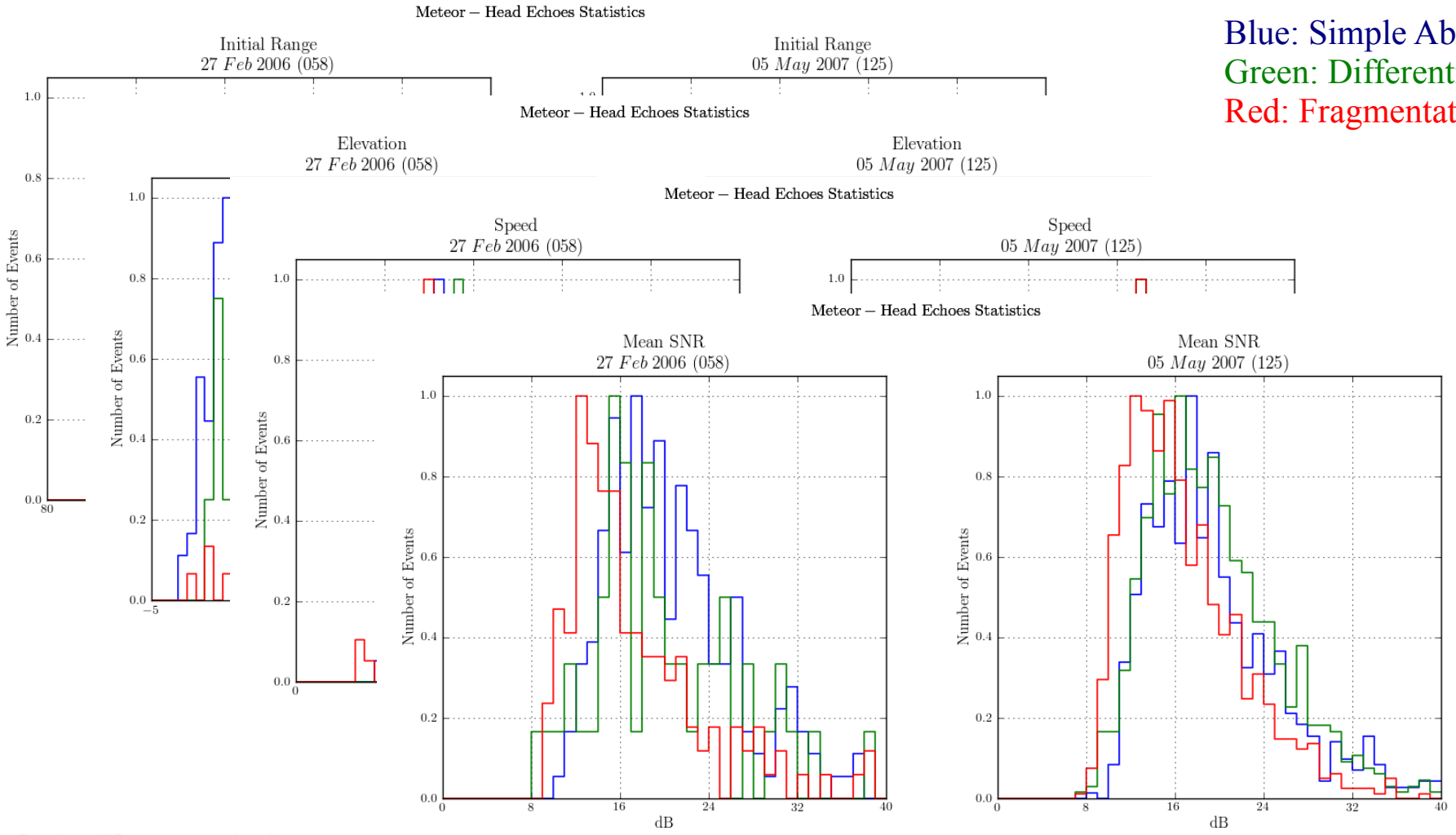

Blue: Simple Ablation
Green: Differential Ablation
Red: Fragmentation?

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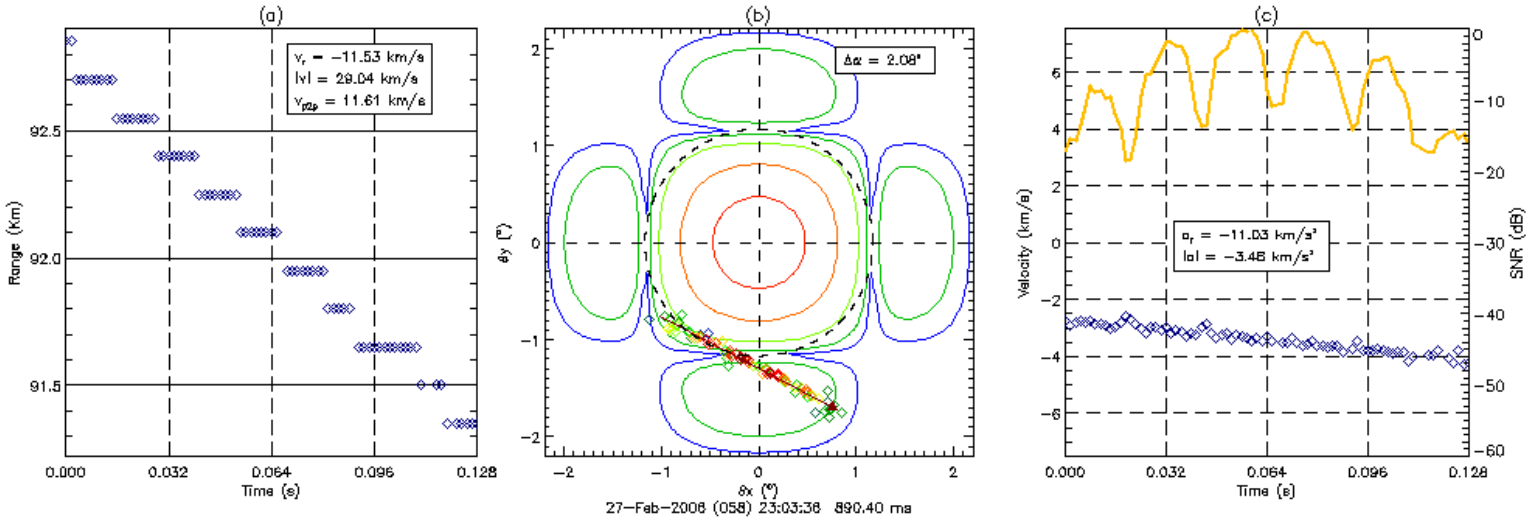
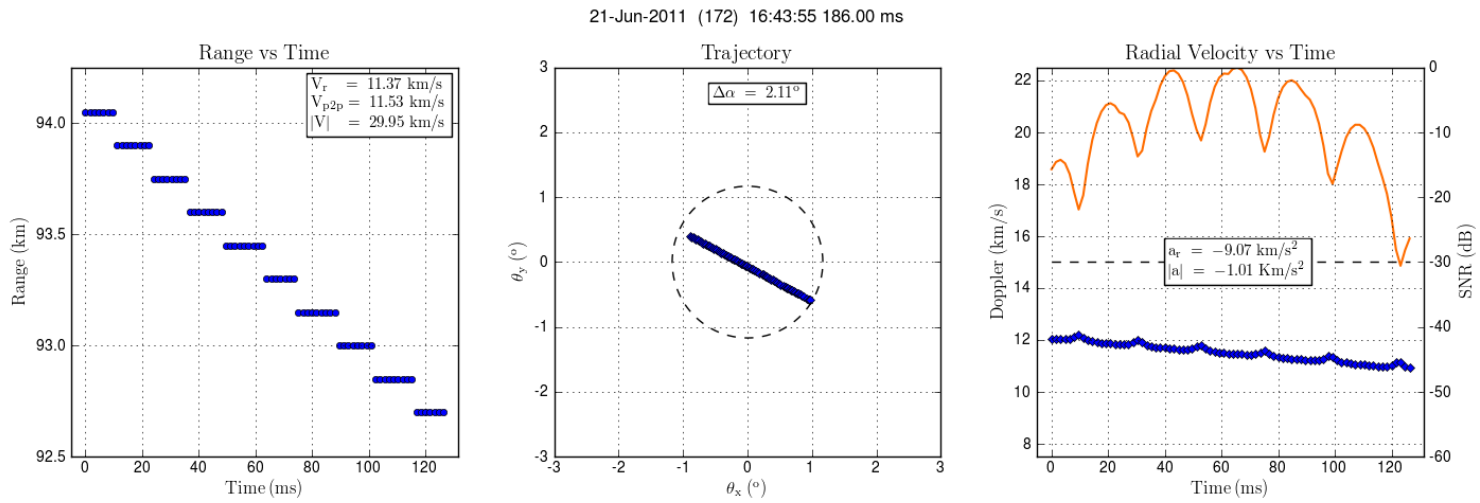
3) Modeling Fluctuations in SNR





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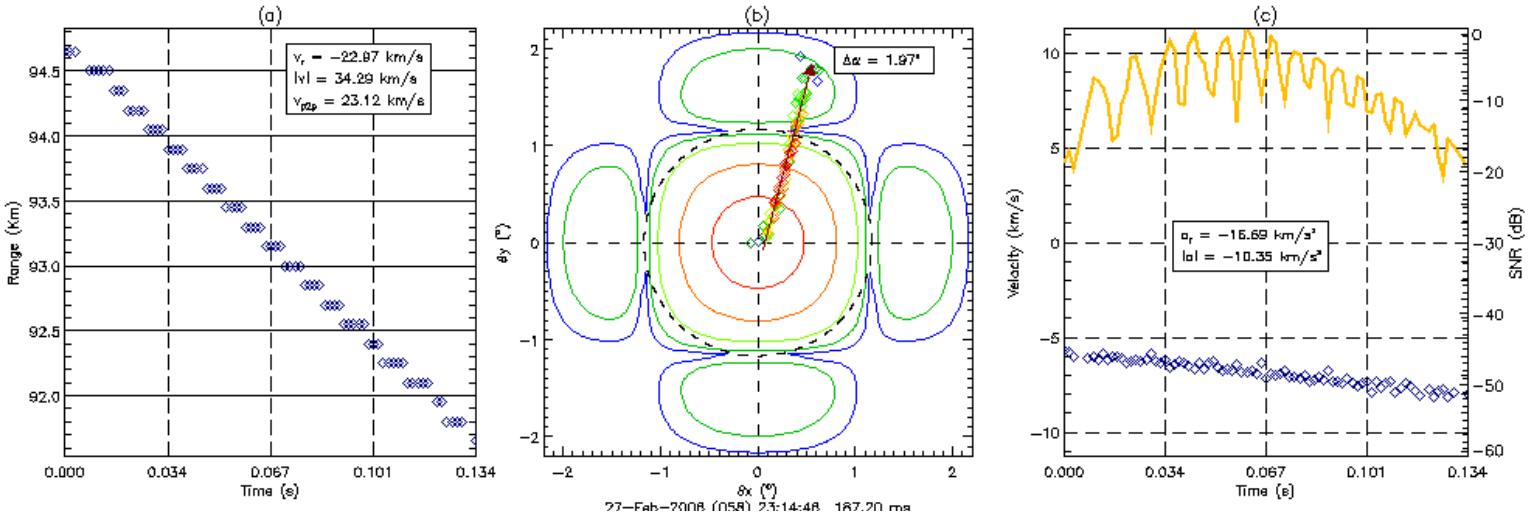

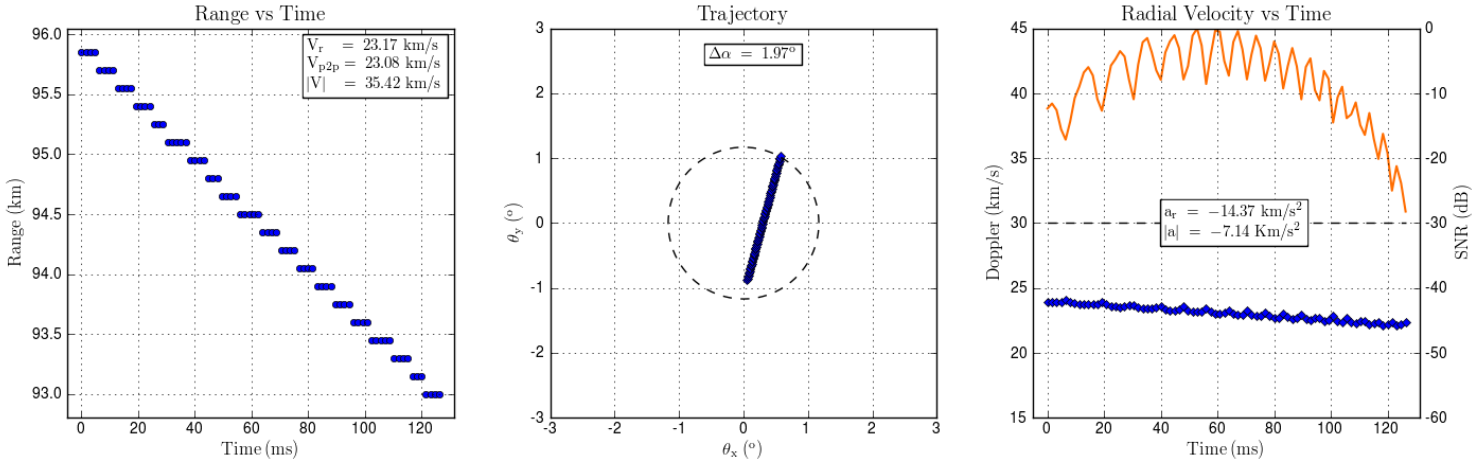

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4) Conclusions

- Some abrupt SNR fluctuations are easily understood as a result of multiple particles back-scattering the transmitted power.

- The first approach model reproduces well the fluctuations observed in the SNR from meteor-head echoes. In addition, this tools give us an idea of the number of particles involved in the process and their relative size.

- What is the minimum relative size between two or more particles to observe their effect in the current data.

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Thanks!

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