

# Multiple attenuation using a highresolution time-domain Radon transform

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REWES

# Outlines

Brief review to the Radon transform
The high-resolution time-domain Radon transform

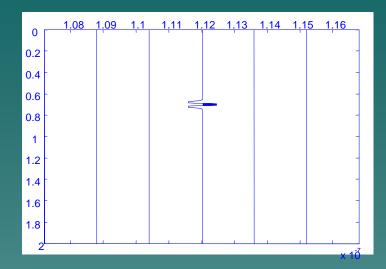
Data examples

Conclusions

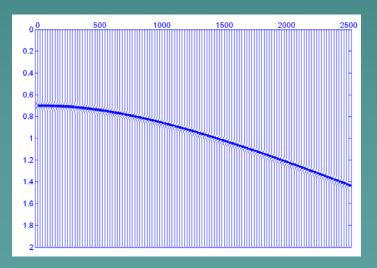
Acknowledgements

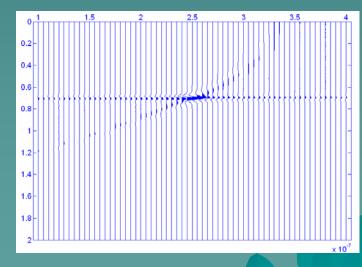
### The Radon transform





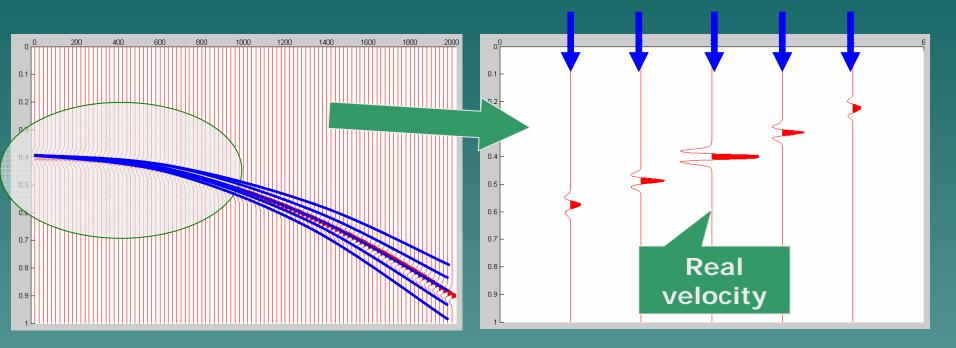
#### The ideal Radon transform





Why? What can we do about it?

# The Radon transform



### **CMP** gather

**Radon panel** 

-Near offsets data are repeatedly transformed into the Radon domain;

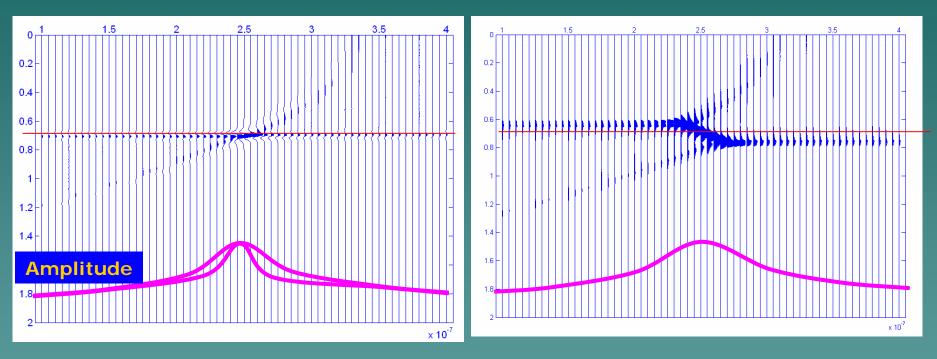
-Near offsets energy sharing causes smearing problem.

### Step 1 – semblance weighting

- Weighting the transform with the semblance of the input gather;
- Semblance is independent of amplitudes of events and ranges from 0-to-1;
- Semblance is coherency measurement.

### Step 2 - sorting

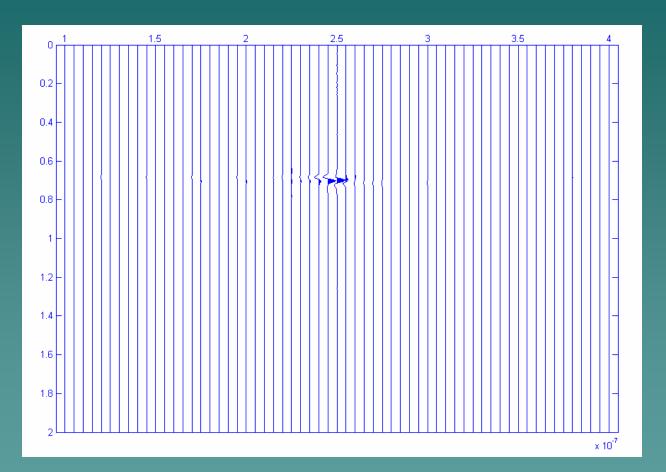
- Find out the most important traces in the Radon domain;
- First transform data along these important traces and remove the corresponding data from the input gather.



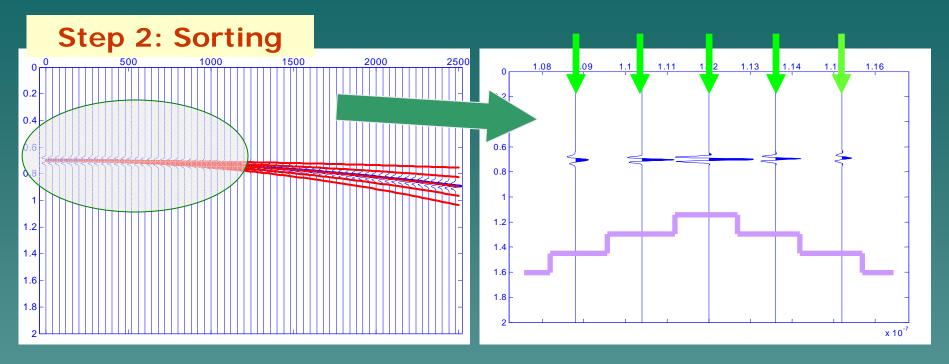
**Radon panel** 

Semblance plot 0~1

What if we weight the Radon panel by the semblance plot?



The Radon panel by weighting the conventional Radon transform with the semblance plot



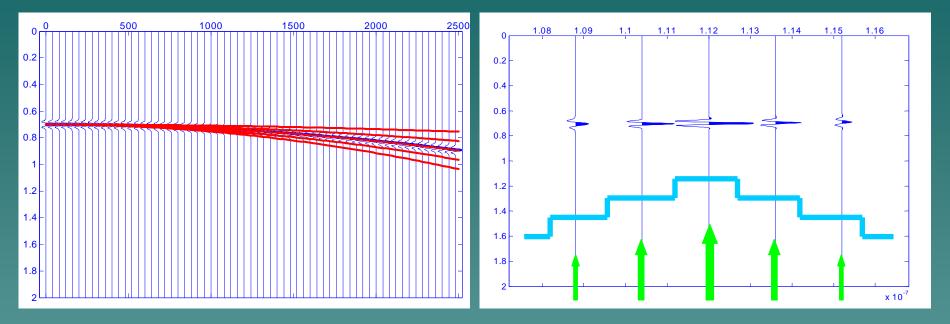
### **CMP** gather

### **Radon panel**

-Near offsets data are repeatedly transformed into the Radon domain, which causes smearing problem;

-How to avoid transforming data repeatedly?

-If it is avoided, can we reduce the smearing?

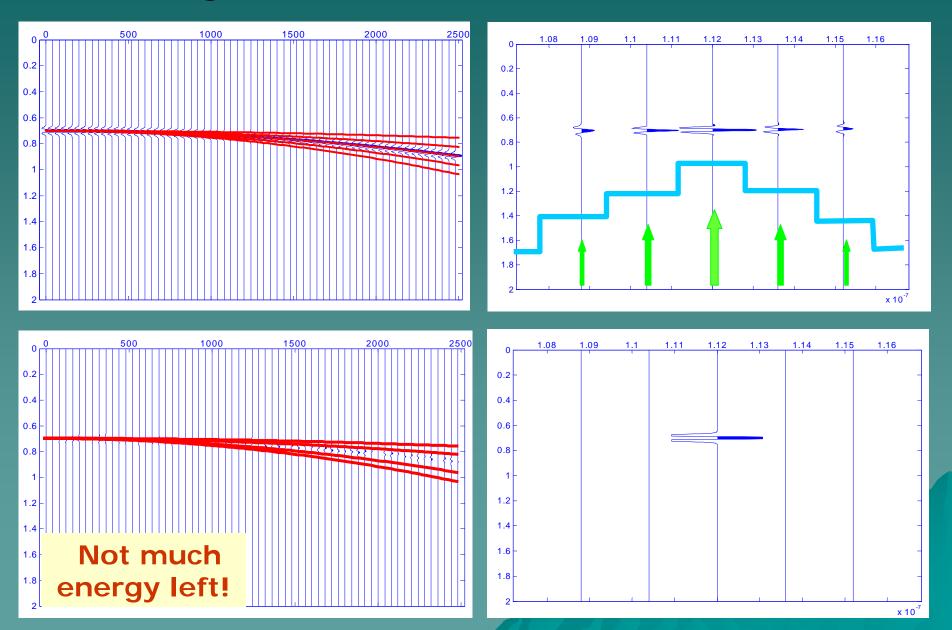


### **CMP** gather

#### **Radon panel**

-Once a Radon panel is obtained by the semblance-weighted method, energy along each trace is estimated;

-A new turn of Radon calculation is first performed along the most powerful trace and corresponding data will be removed from the input.



### Data Example

 The high-resolution time-domain Radon transform is applied to the White Rose seismic dataset. The waterbottom and peg-leg multiples have strong effects on data quality.

 Multiple attenuation becomes one of the key issues for seismic interpretation.

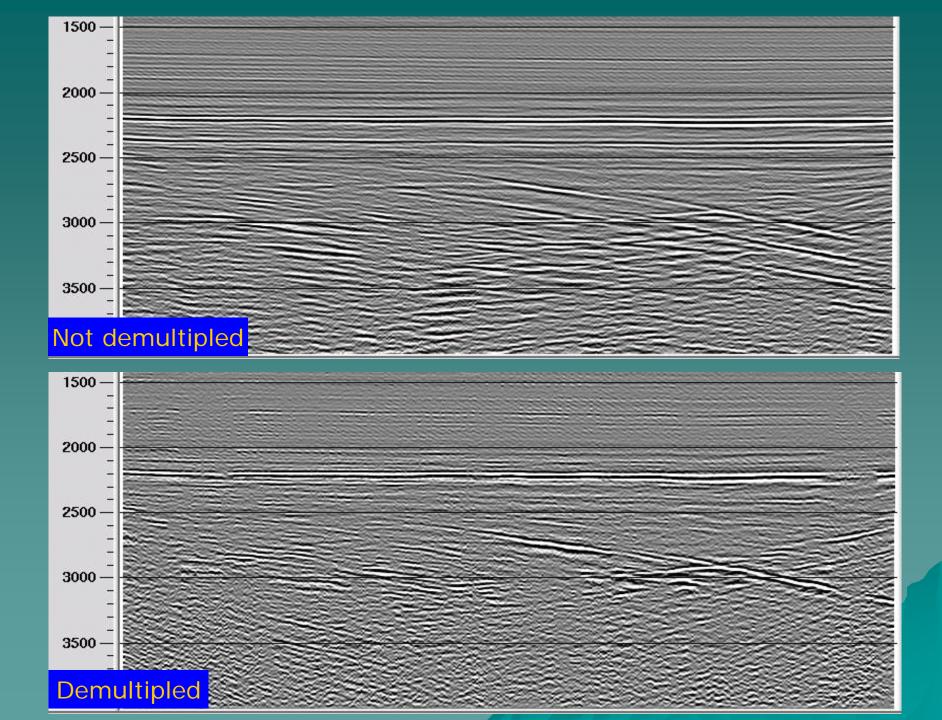
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# Conclusions

The Radon transform is reviewed;

The estimation and utilization of the energy power along the q axis lead to the high resolution in the Radon domain;

 The application of the high-resolution Radon method to a real dataset approved the validity of the algorithm.

# Acknowledgements

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CREWES staffs

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