Breakout Session: Confronting cloud microphysics schemes with Radar Doppler Spectra

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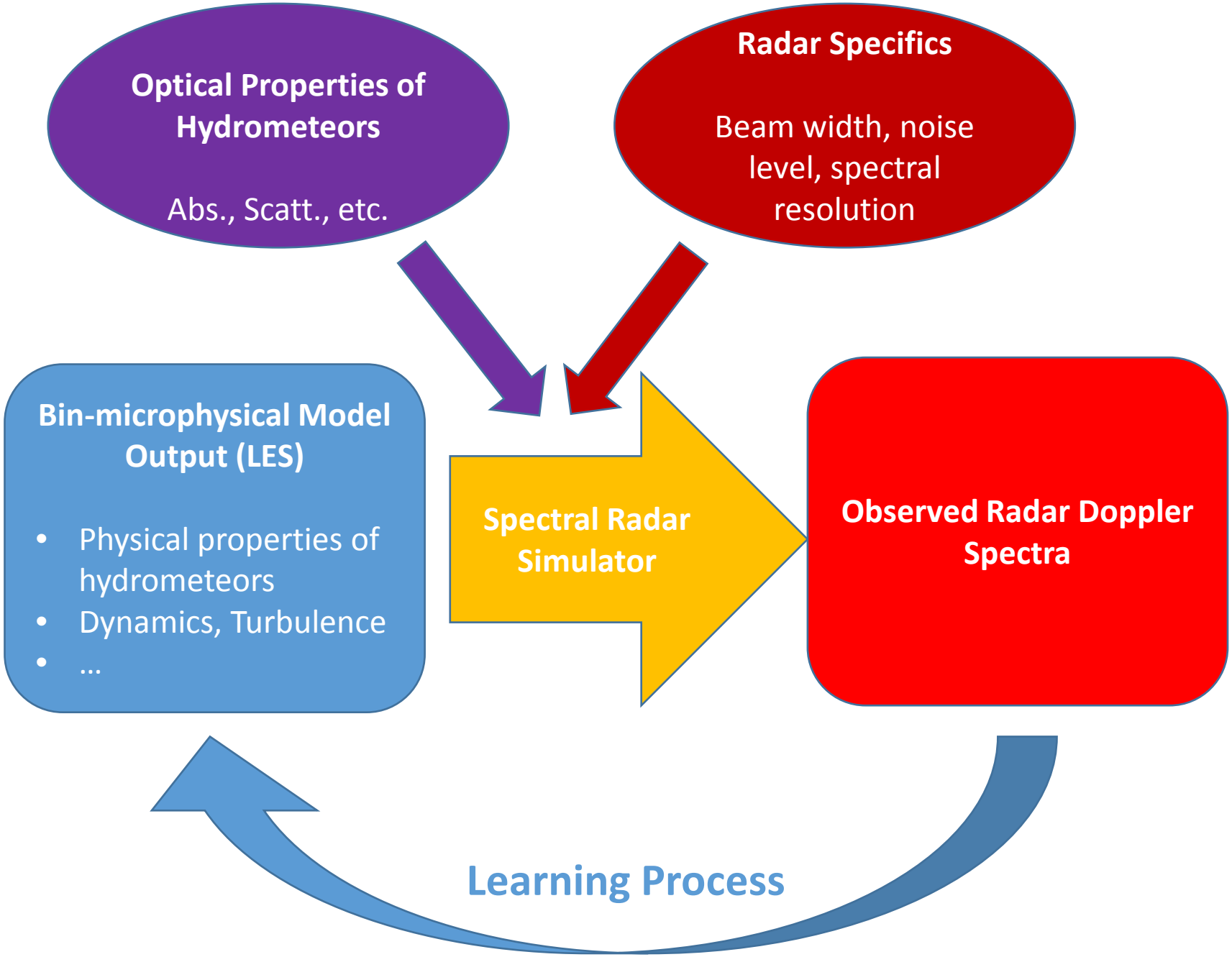
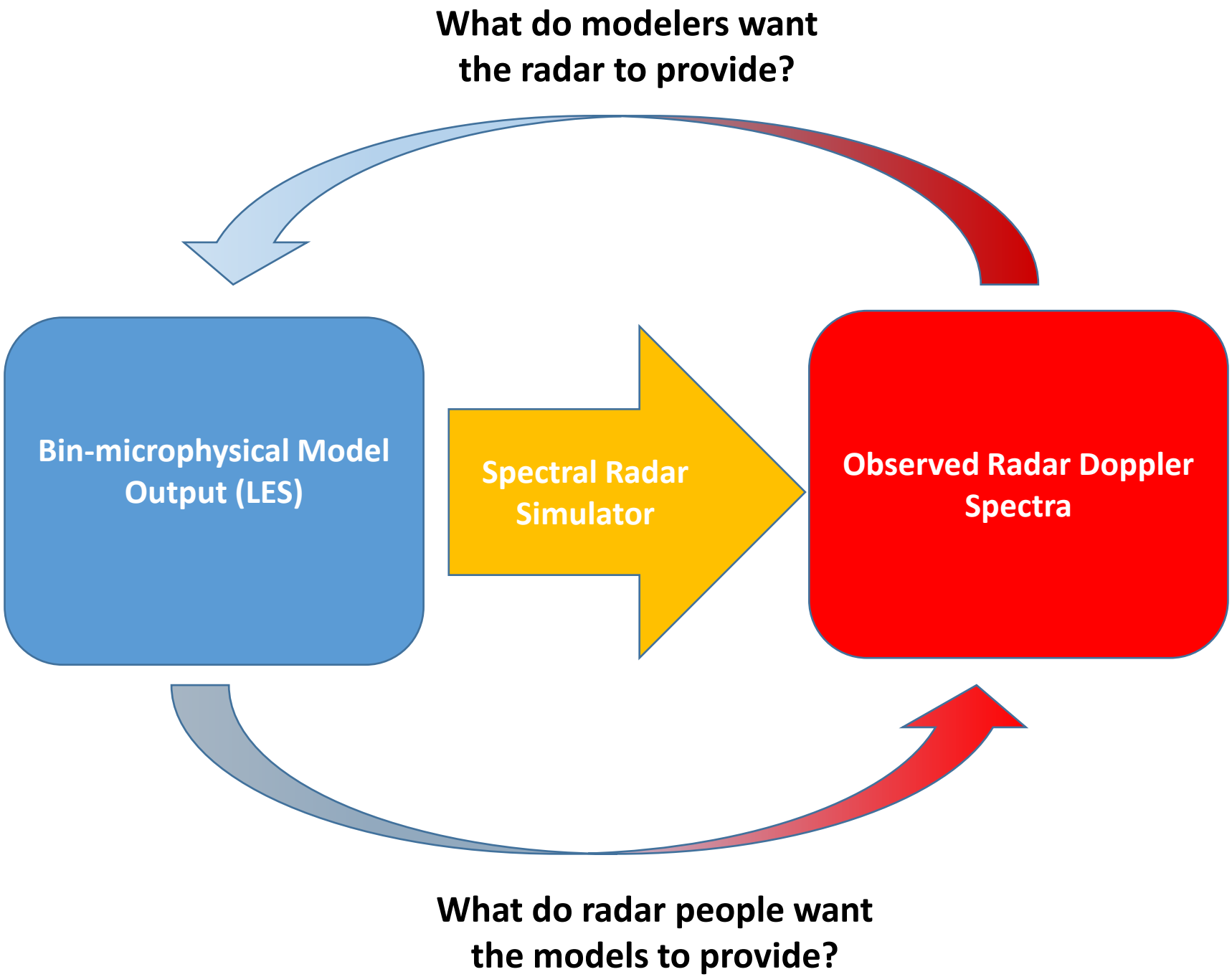
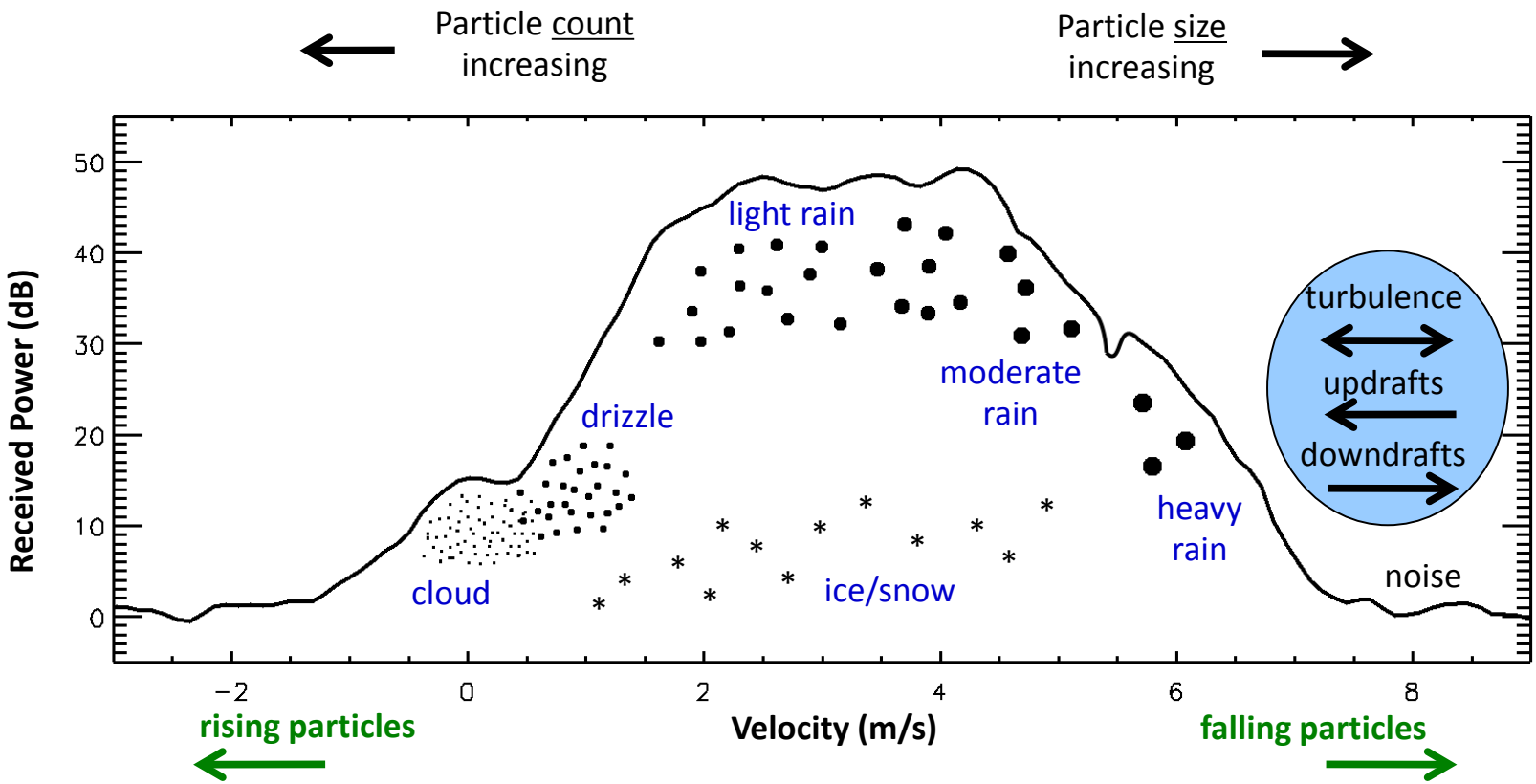
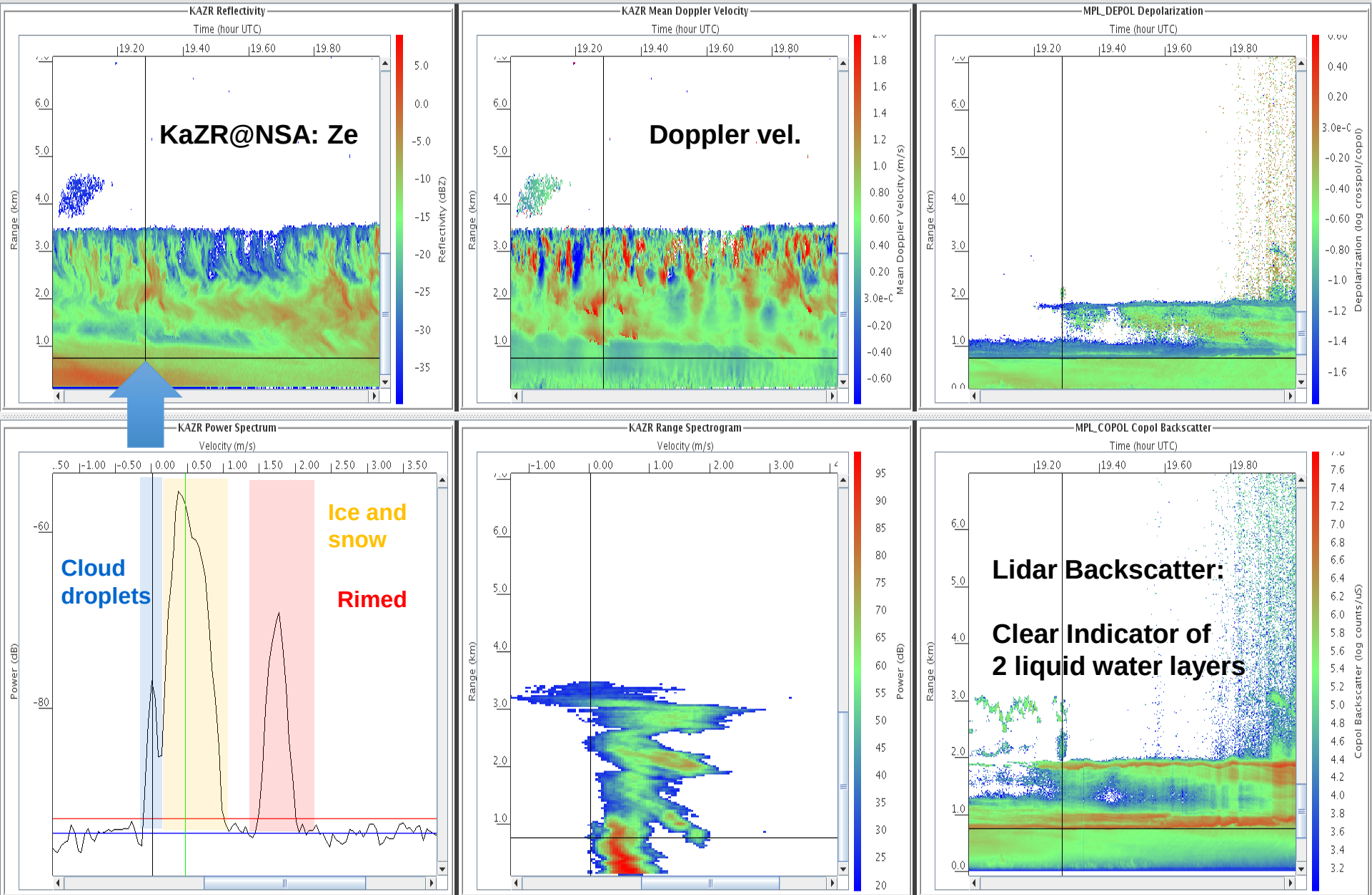

Optical Properties of Hydrometeors
Abs., Scatt., etc.
Radar Specifics
Beam width, noise level, spectral resolution
Bin-microphysical Model Output (LES)
• Physical properties of hydrometeors
• Dynamics, Turbulence
• …
Spectral Radar Simulator
Observed Radar Doppler Spectra
Learning Process


What do modelers want the radar to provide?
Bin-microphysical Model Output (LES)
Spectral Radar Simulator
Observed Radar Doppler Spectra
What do radar people want the models to provide?

What is the Doppler Spectrum influenced by?

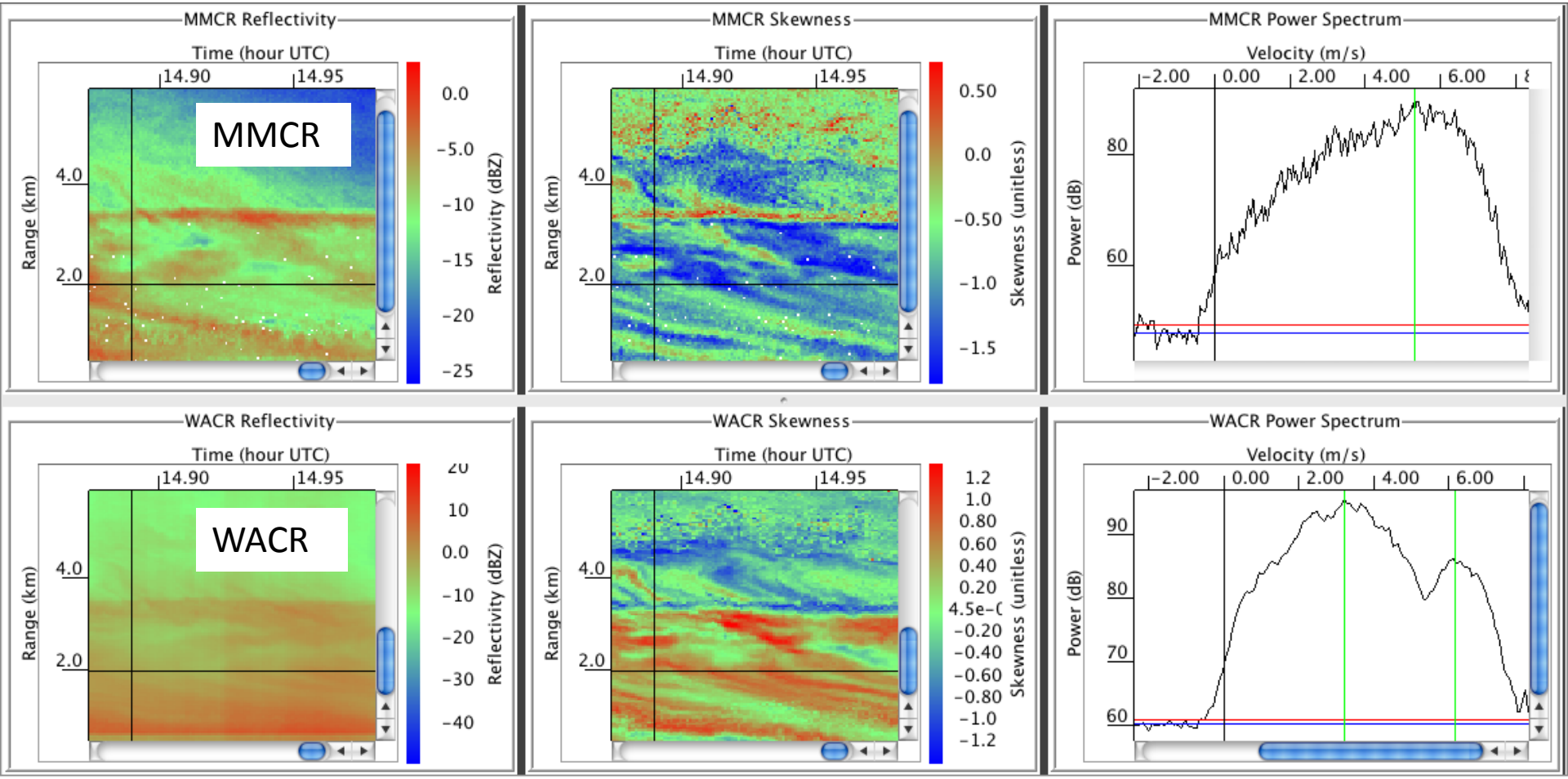


Example for spectral information: Riming (arctic mixed phase)

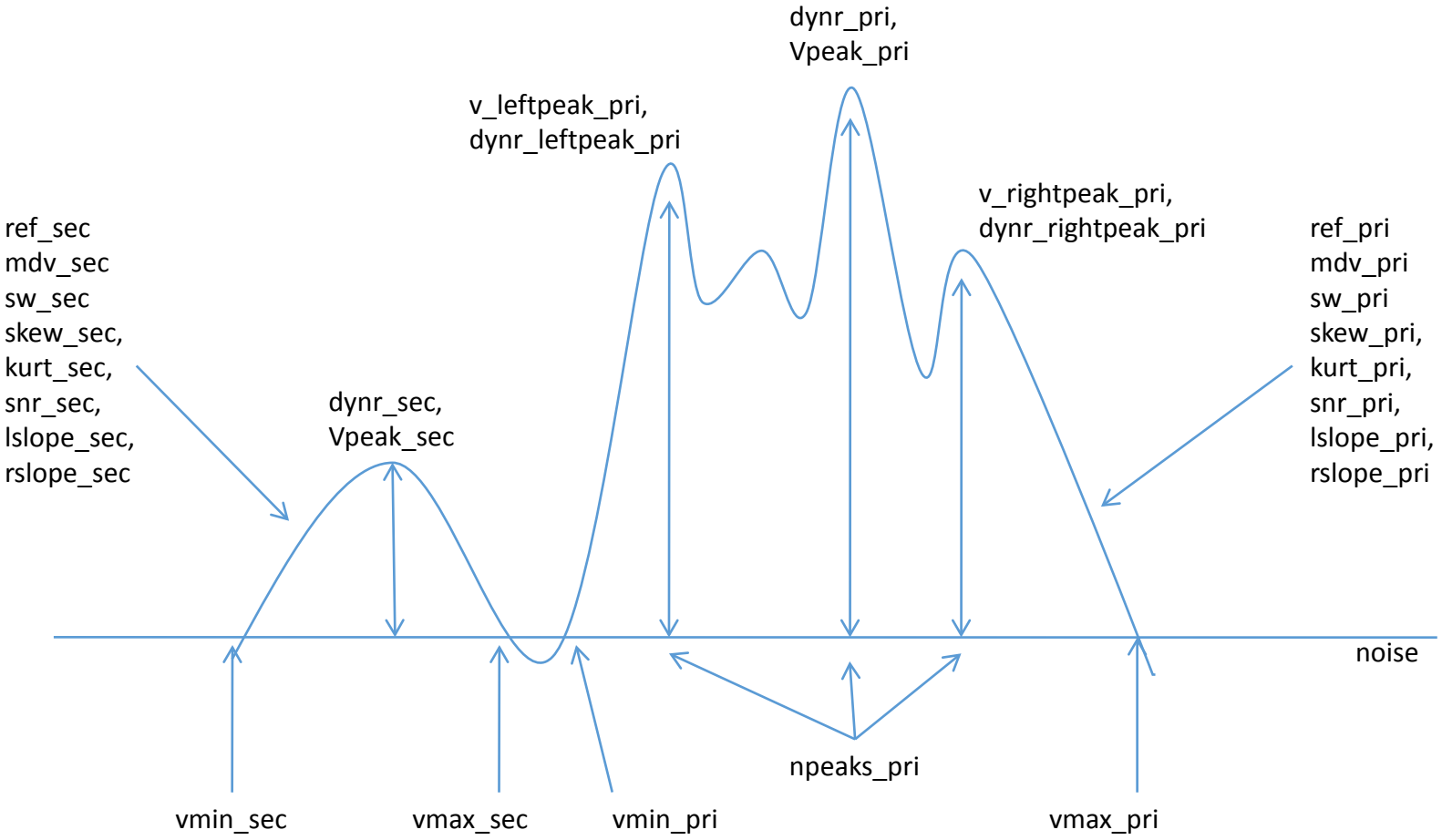


Dual-frequency Spectra Comparison

SGP 20080507 Stratiform Rain



MicroARSCL Parameters



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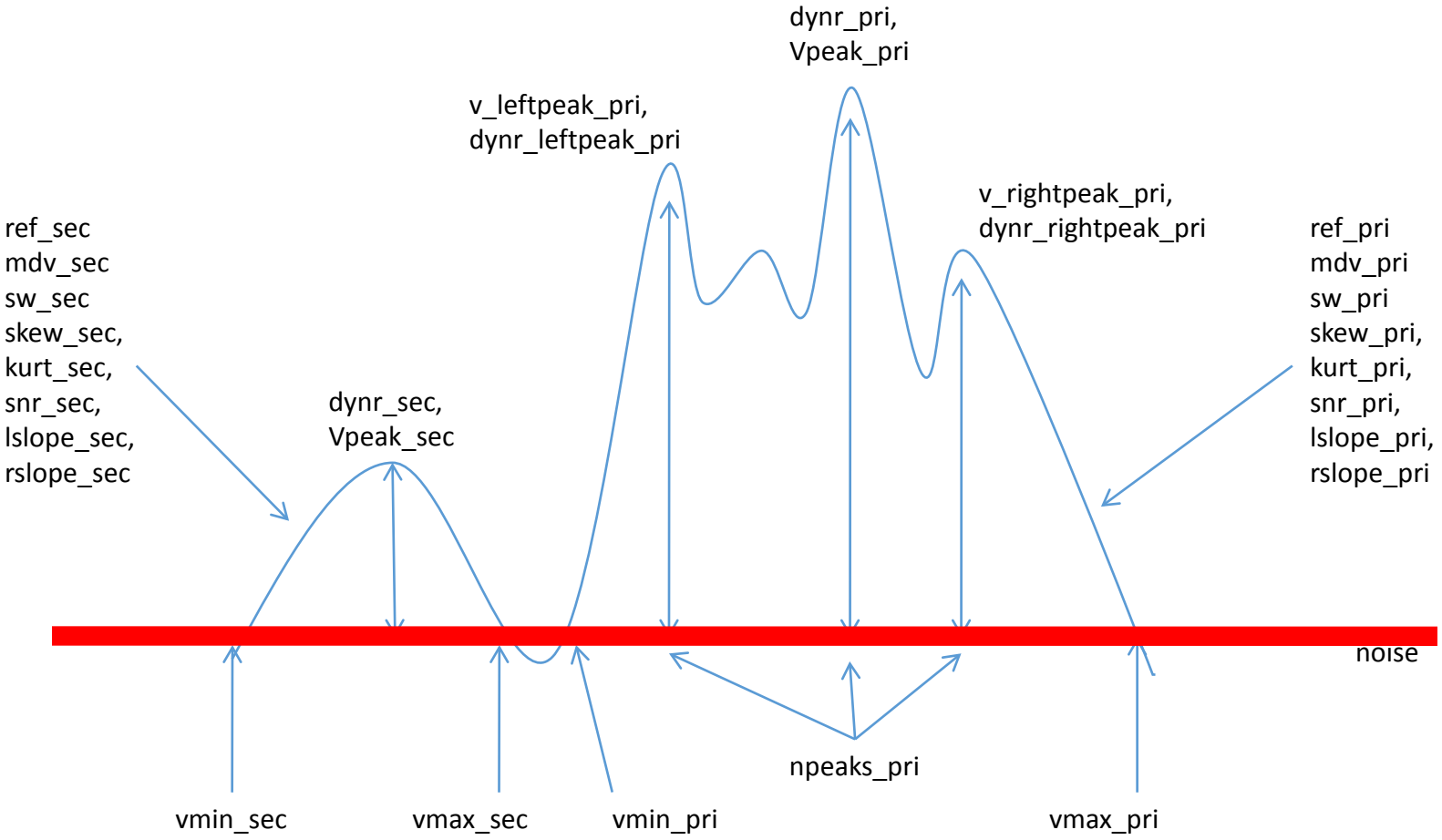

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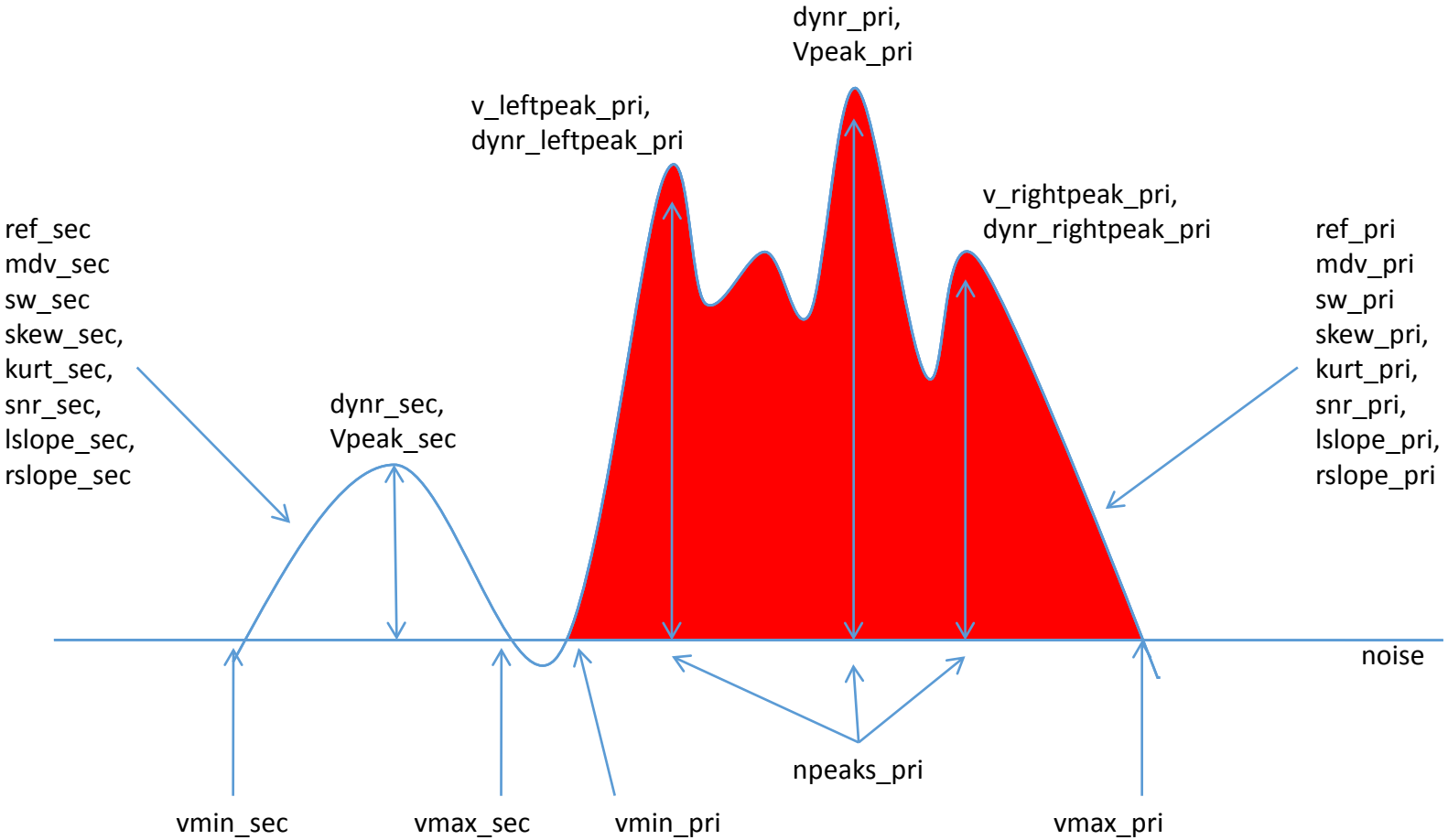

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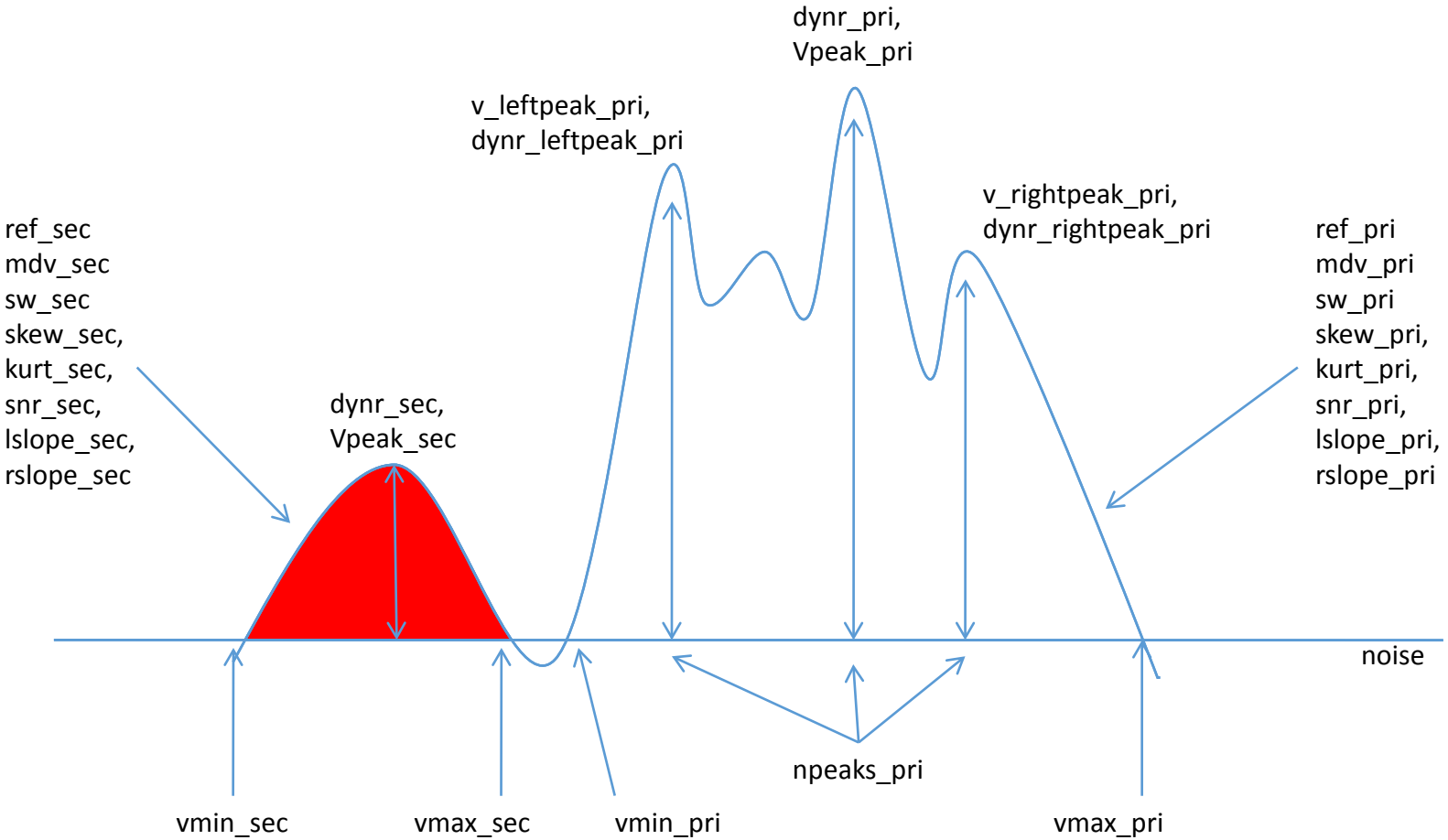

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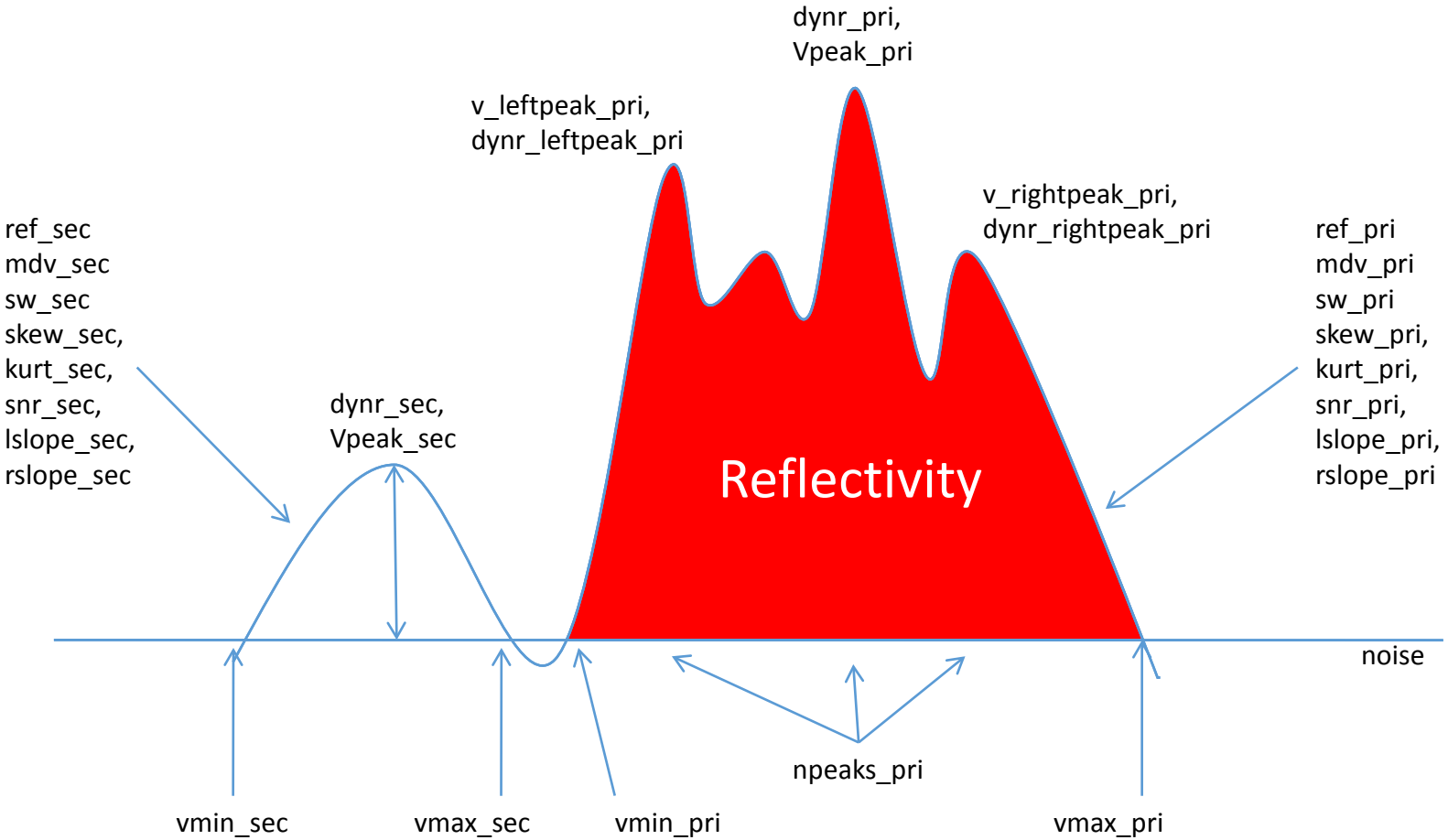

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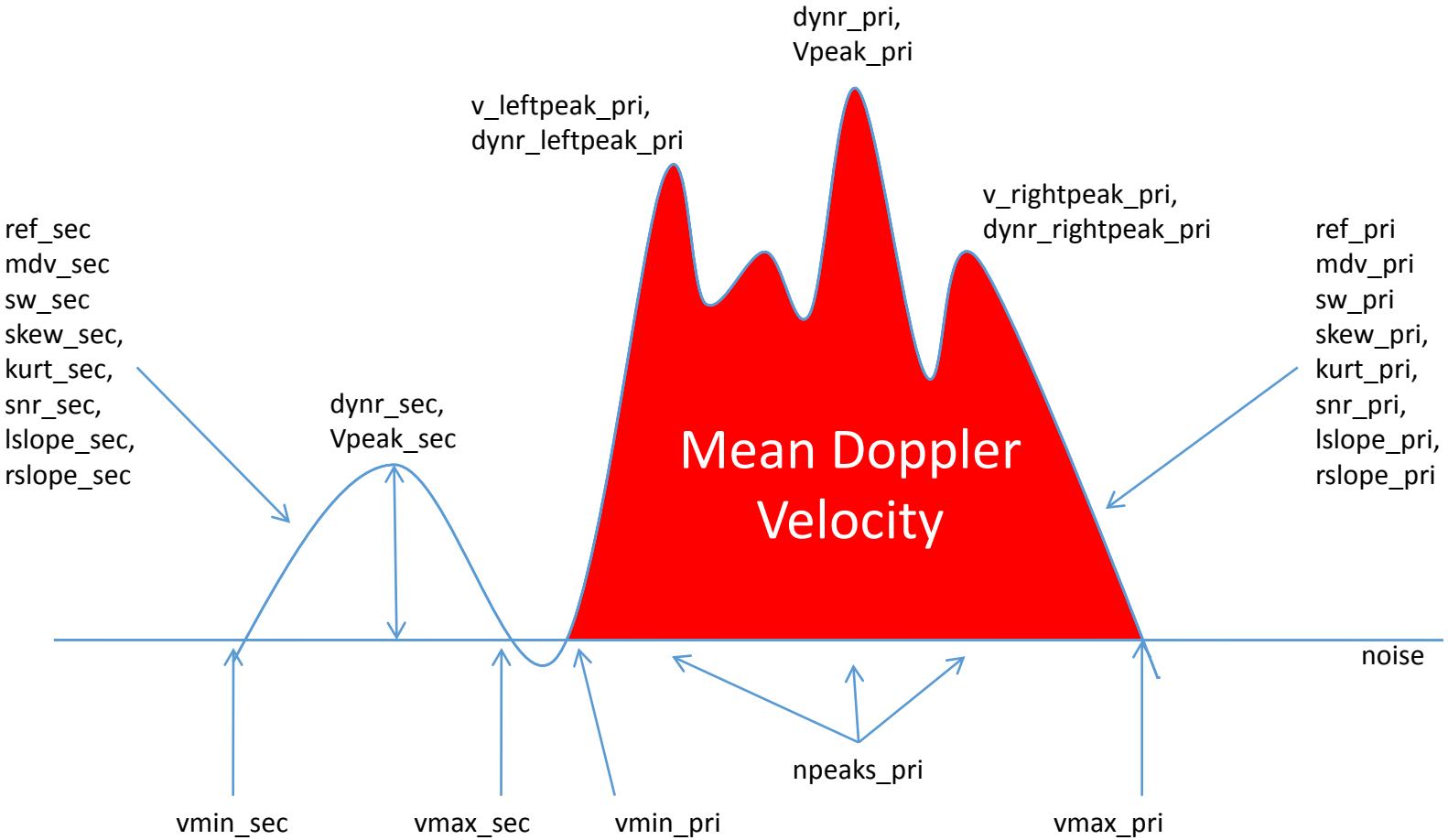

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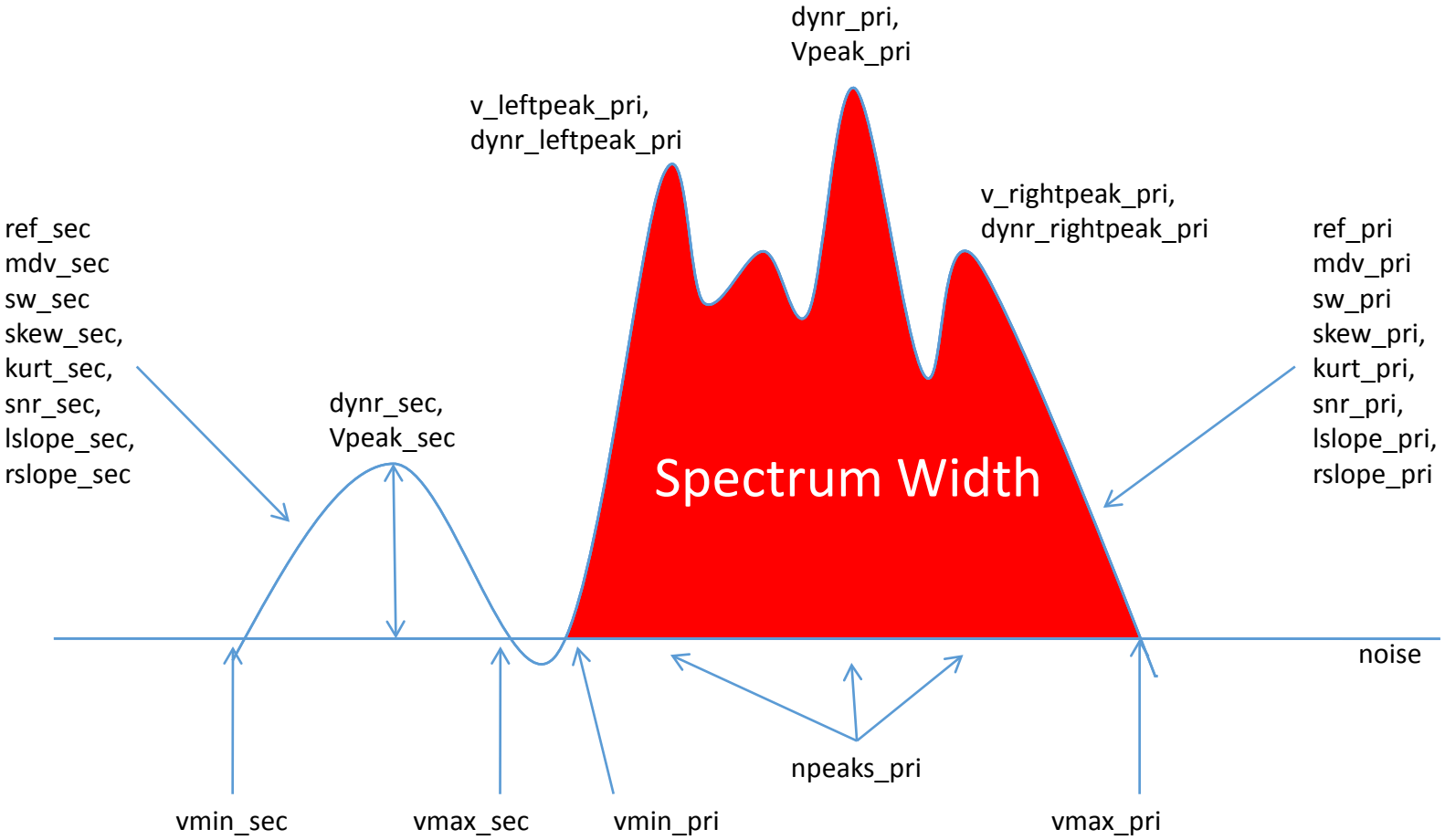

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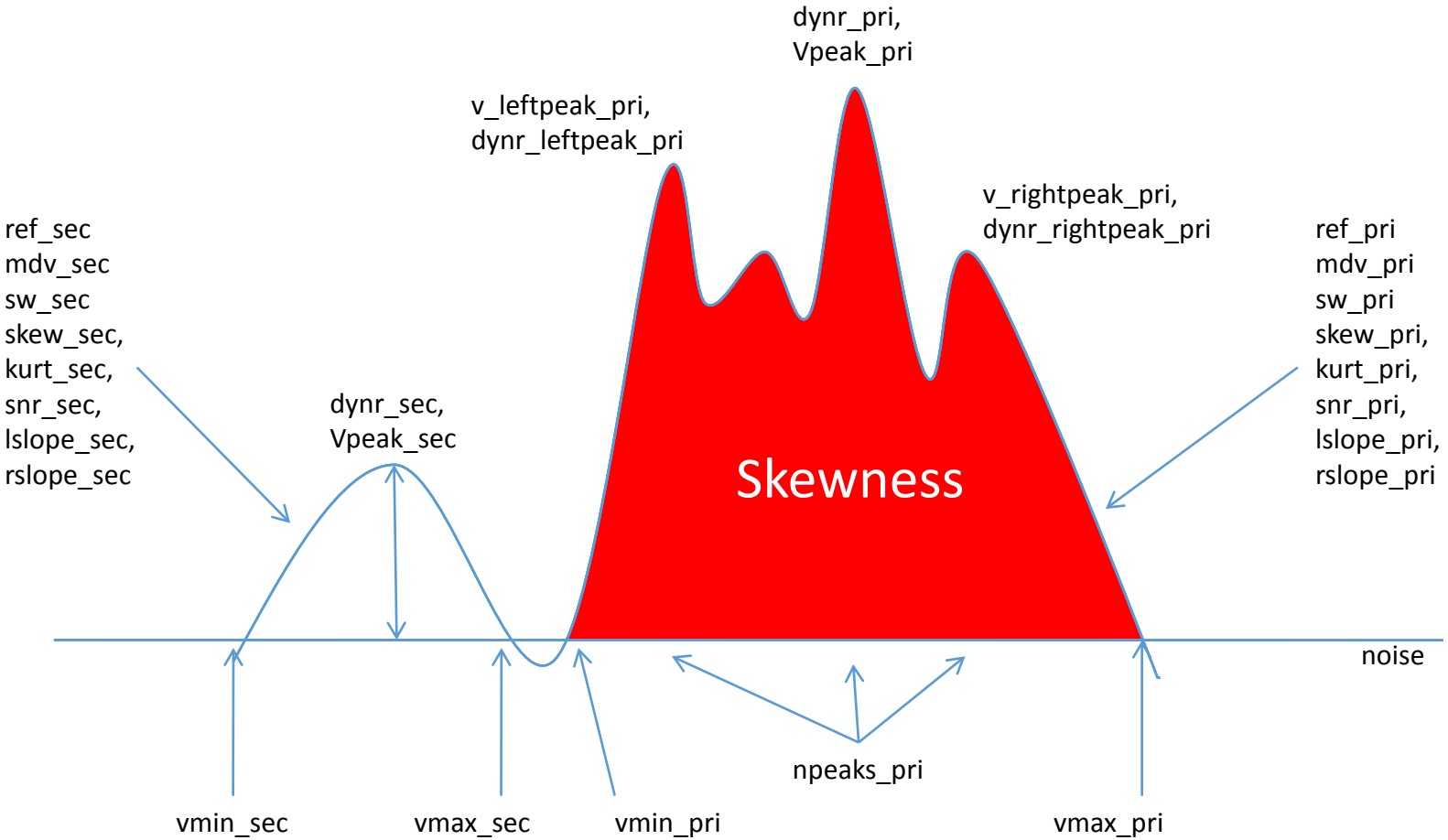

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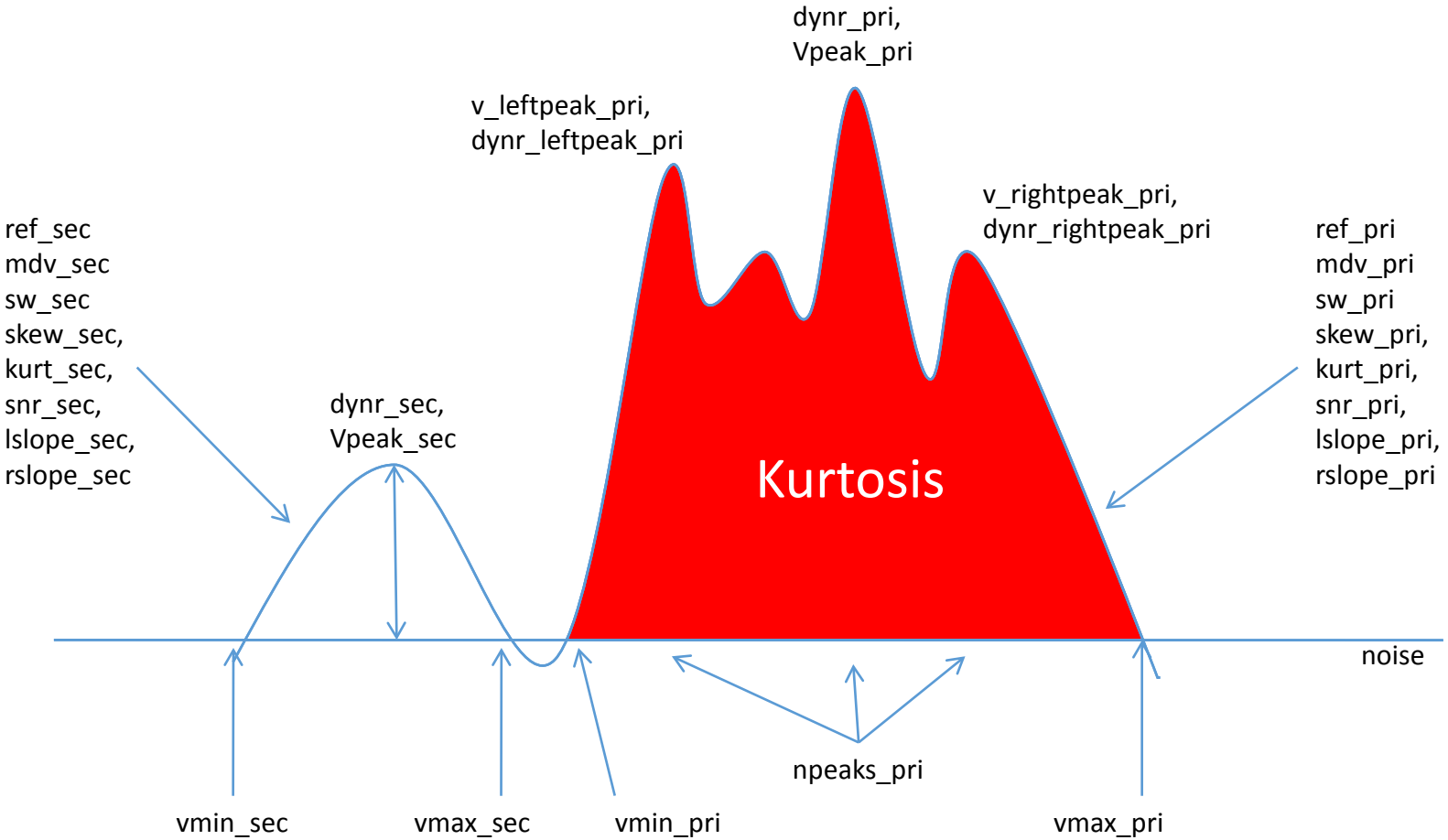

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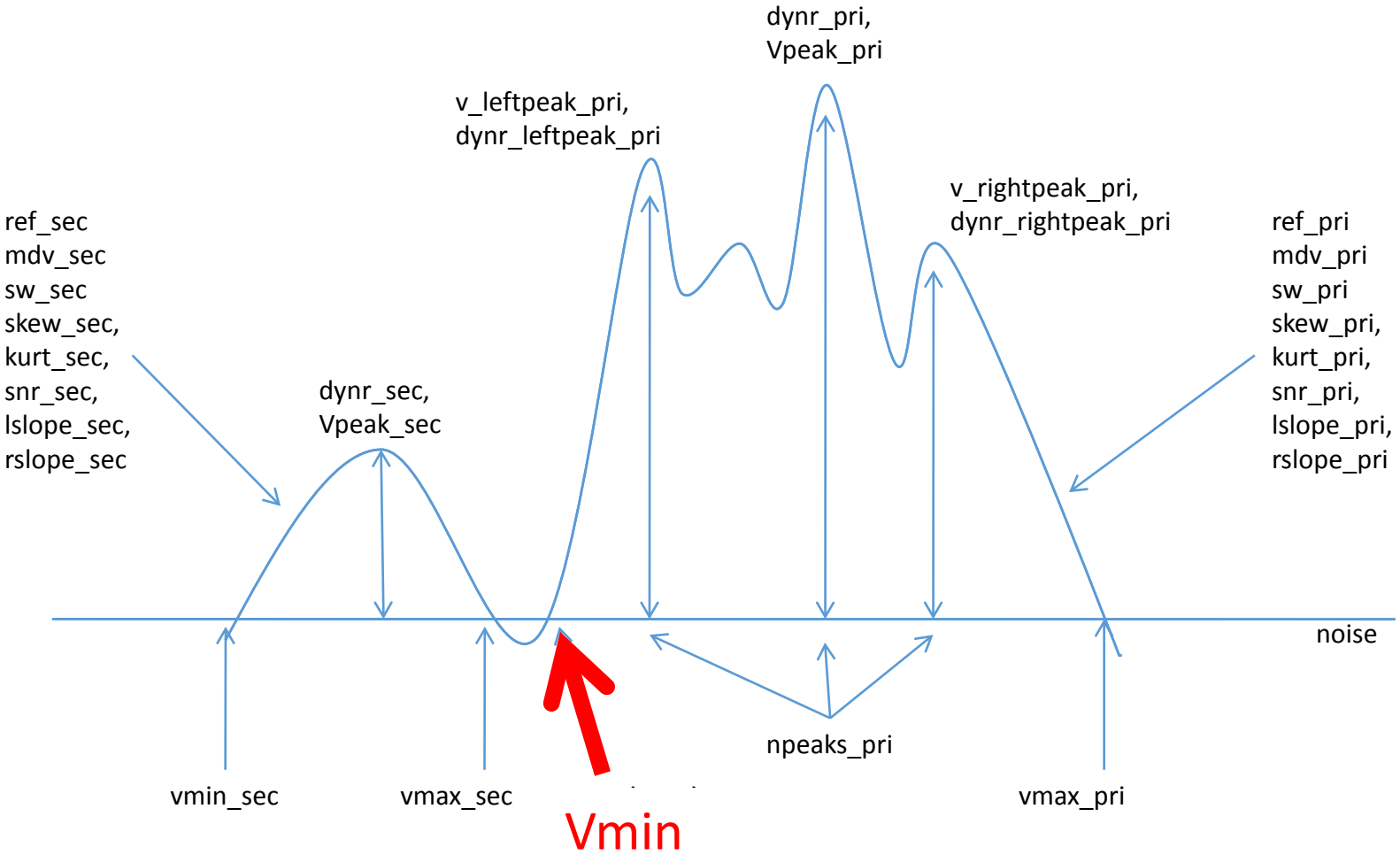

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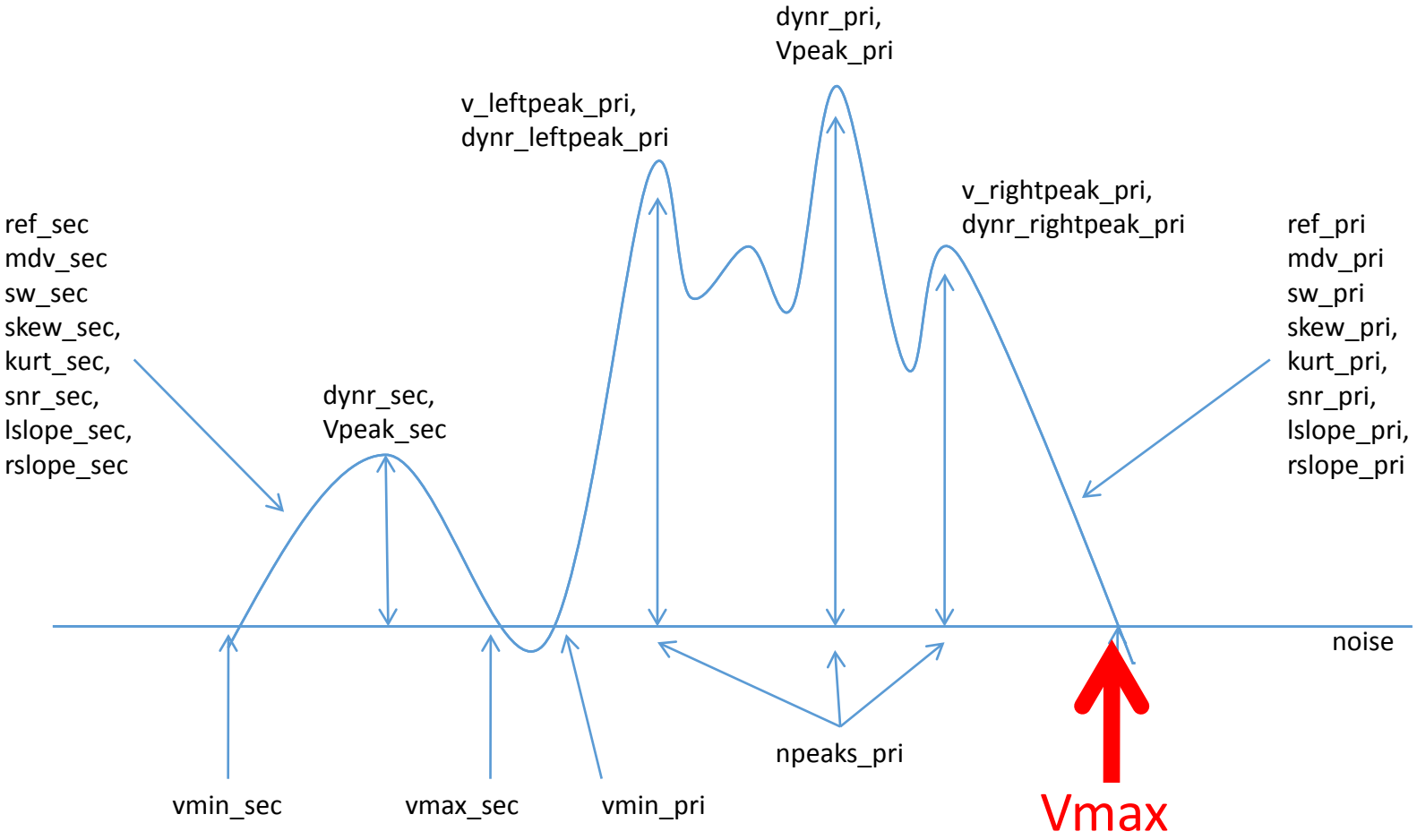

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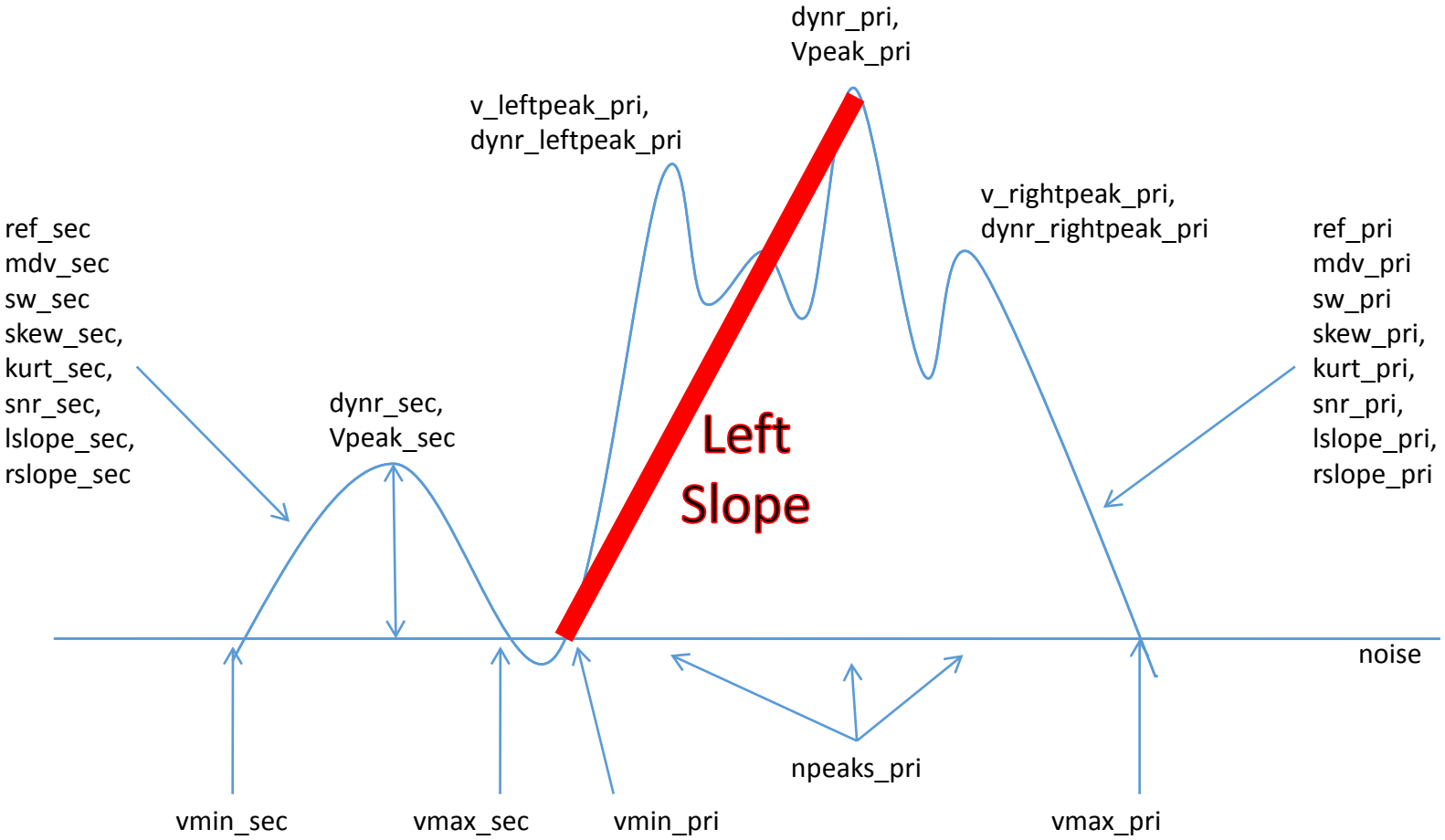

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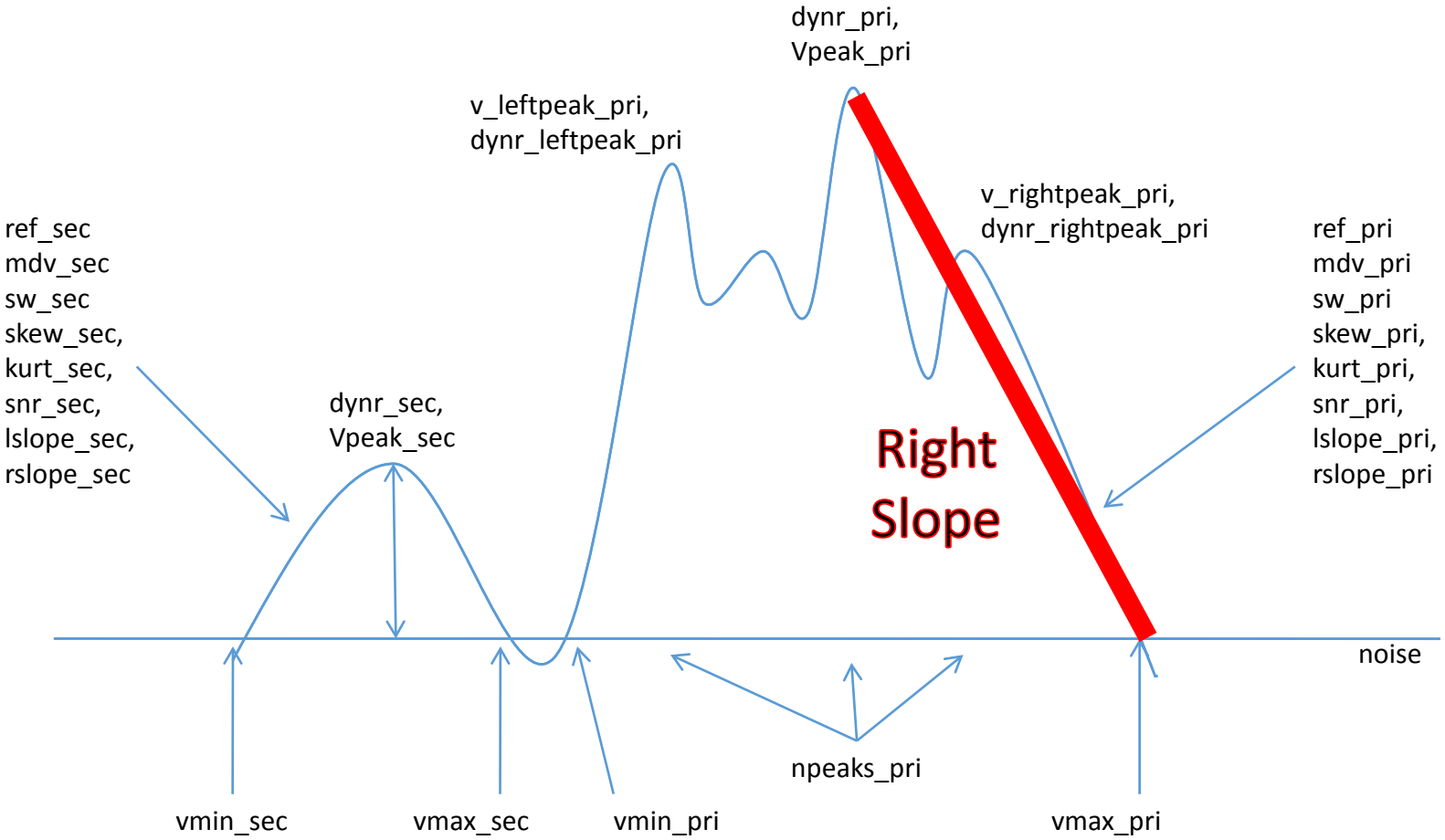

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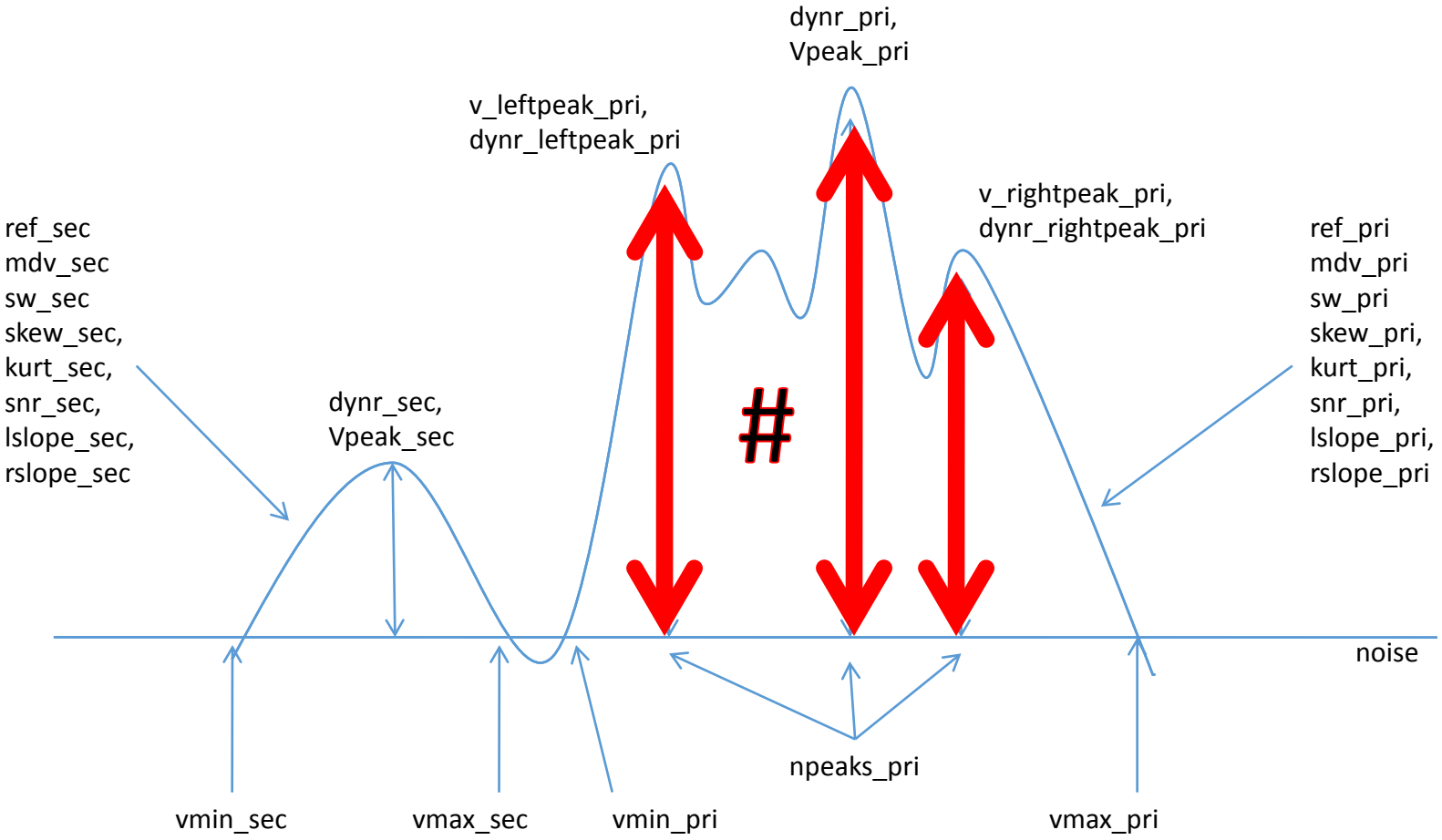
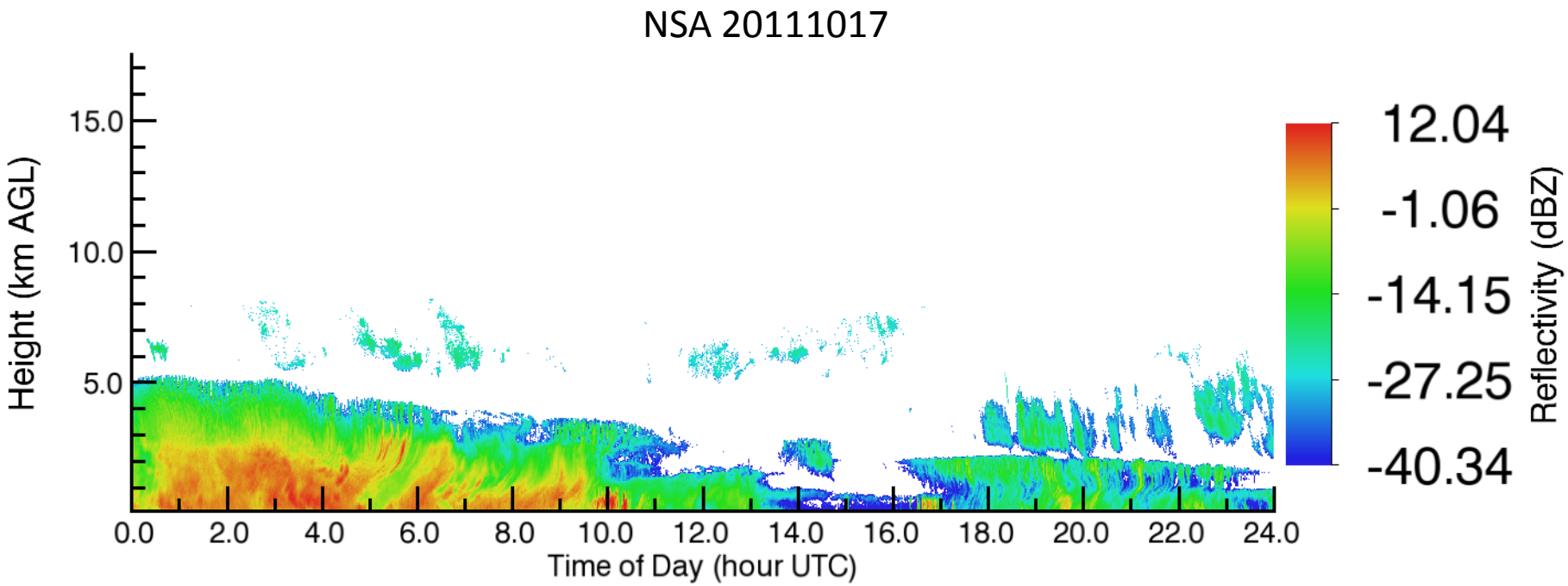
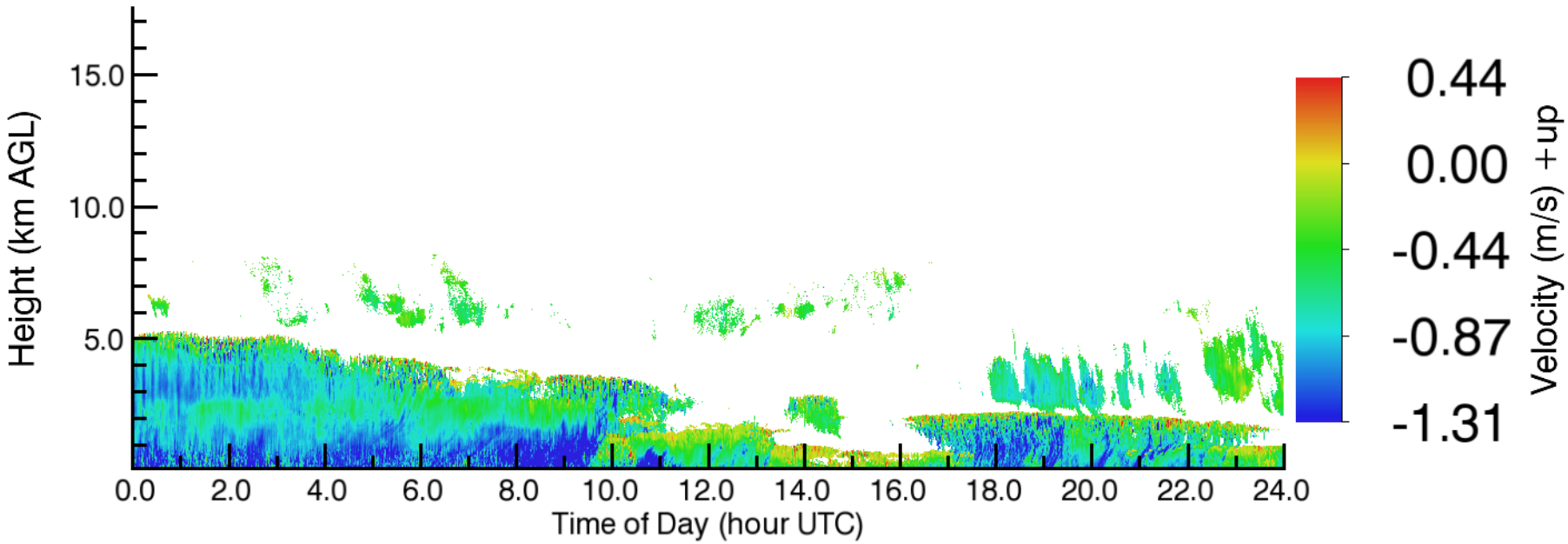


Reflectivity Principle Peak

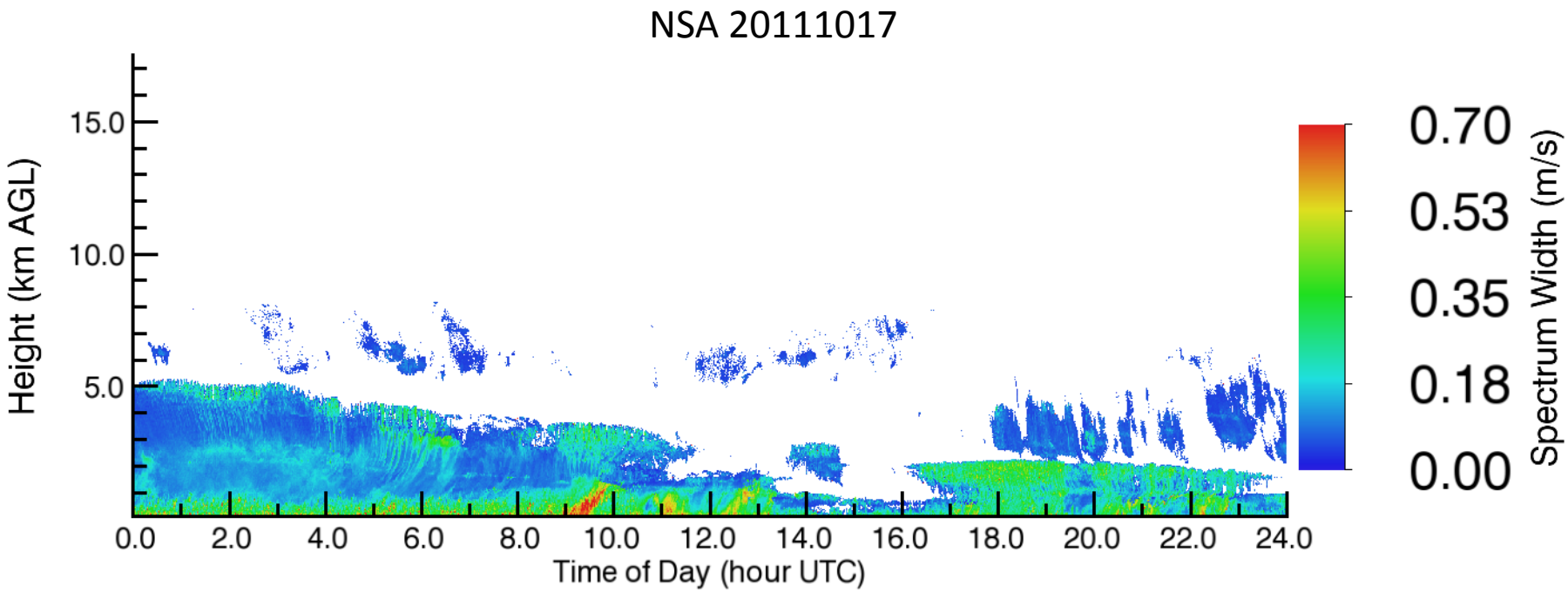


Mean Doppler Velocity Principle Peak

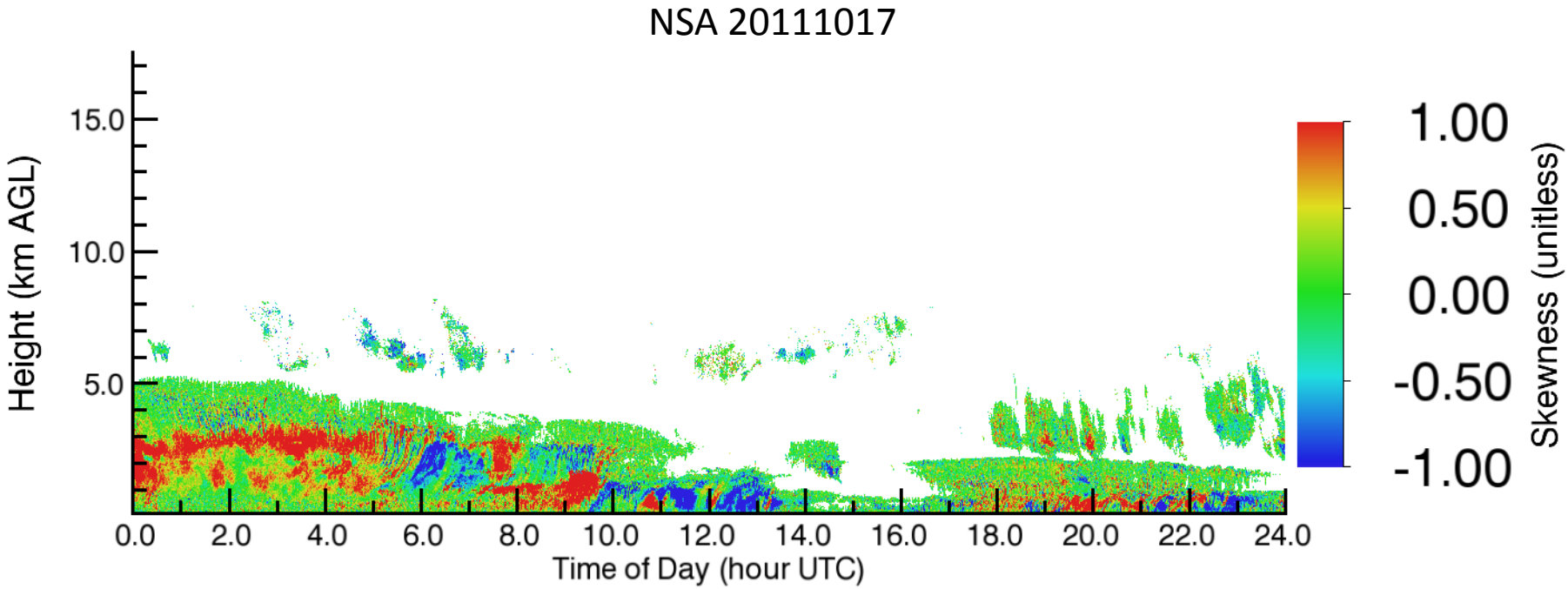
NSA 20111017



Spectrum Width Principle Peak



Skewness Principle Peak



Number of Principle Subpeaks

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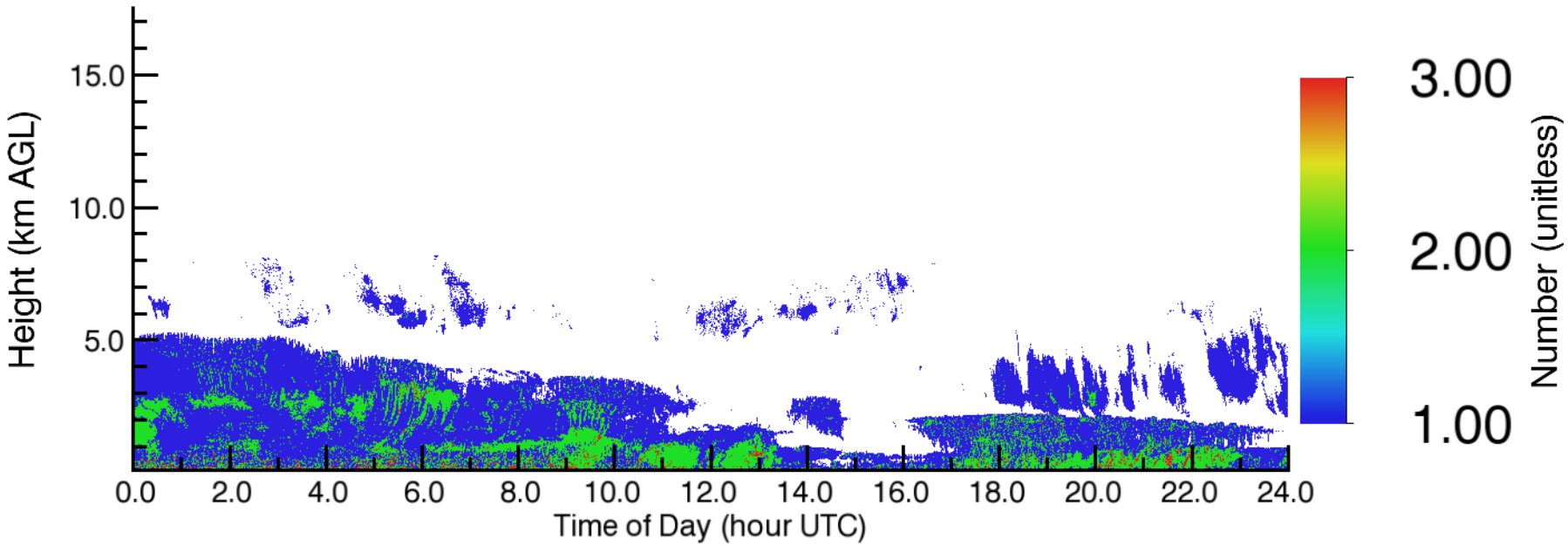

Right Slope Principle Peak

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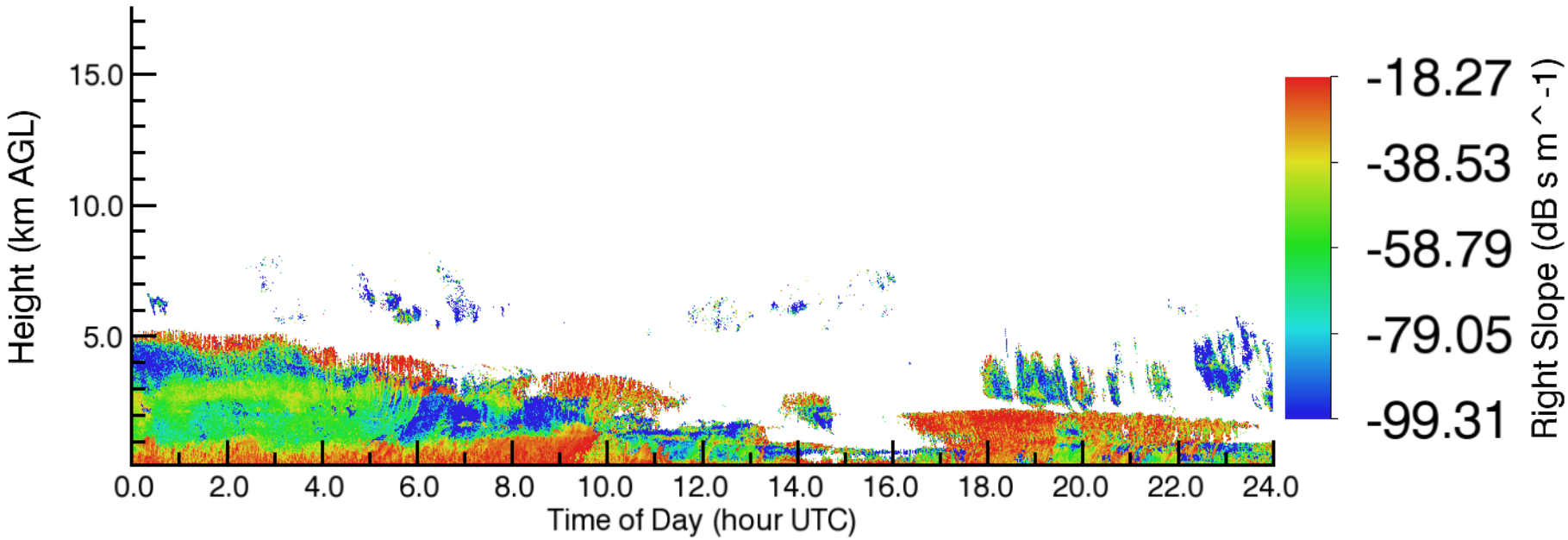
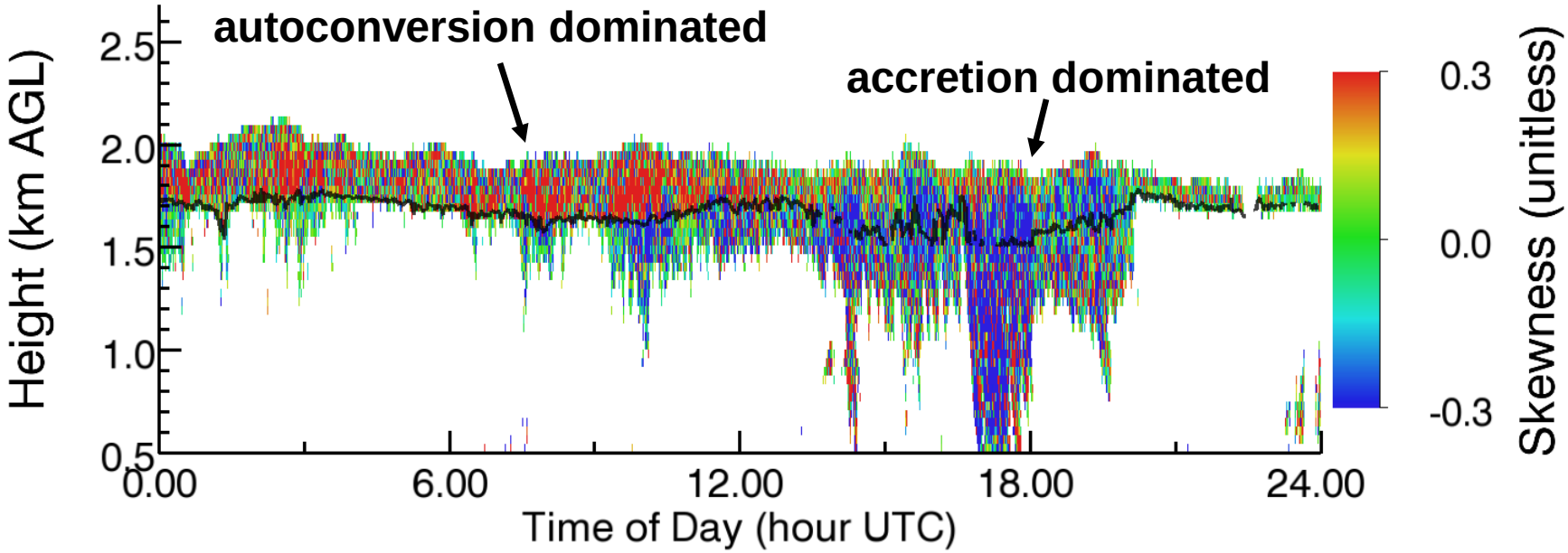


Example: Spectrum Moments (Skewness) in Marine StCu

Can a bin microphysical scheme represent this?



GRW 20100727

Jasmine Remillard and Maximilian Maahn: **The workings of a radar spectrum simulator and its use to evaluate LES.**

Ann Fridlind: **Observational constraints on precipitation formation and evolution in cloud-resolving simulations.**

Hans Verlinde: **Evaluating models of mixed-phase cloud processes.**

Discussion Topics:

- How can we start a (LES)-model Doppler spectra comparison and learn from meeting to meeting?
- Interest in establishing a **Doppler Spectra interest group**?
- Should we start a **communication platform** for this project like Trello? Mailinglist?
- Should we identify a certain **test case** from the ARM dataset for the comparison?
- With which kind of cloud should we start? **Liquid** (no problems with optical properties, could be preparation for SGP LES testbed) or **mixed phase** (Same as Cloud Life Cycle Group: 11/12 March 2013 @ NSA)?
- Can we do such a comparison with **bulk microphysics** models or do we need **bin microphysics** in order to reduce the number of "external" assumptions (PSD from IWC etc.)?
- **Retrieval vs. Forward Simulation**?
- What do modelers want the radar to provide?
- What do radar people want the models to provide?
- Next Steps?