

Cirrus cloud formation by gravity waves

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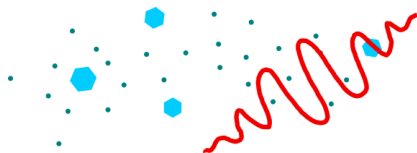
GW-cirrus interactions



Cirrus clouds

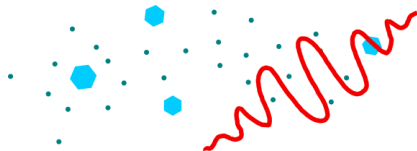
Contour lines: vertical wind with $\Delta w = 0.025$ [m/s], color bar: ice crystal number [kg^{-1}]

GW passing through ice saturated layer



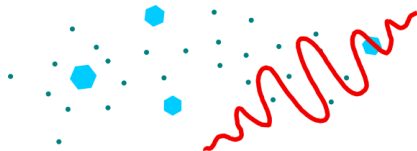
- ▶ homogeneous nucleation: cold temperatures < 240 K
- ▶ ice physics: two-moment bulk microphysics scheme including the effects of nucleation, deposition and sedimentation
- ▶ GW time scale: mid-frequency range
- ▶ asymptotic analysis: reduced model for GW-cirrus interactions

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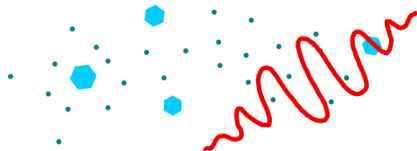
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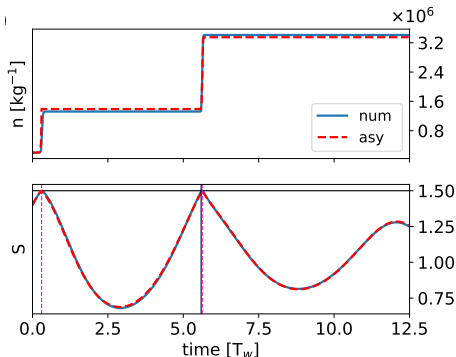
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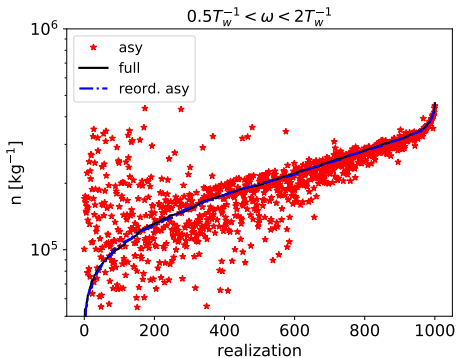


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Nucleated number of ice crystals n



Time evolution of n and saturation ratio S for single GW



Final n for superposition of 10 GWs and 10^3 realizations

See also <https://arxiv.org/pdf/2304.10206.pdf>

