

# Efficient use of spectroscopic data for atmospheric radiative transfer calculations

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With the major increase in the volume of the spectroscopic line lists, disseminating accurate radiative data is a challenge. Considering that even JWST will only acquire spectra at relatively moderate resolution, any approach enabling mid-to-low resolution spectral calculations with low computing and storage costs would be highly valuable.

For these reasons, the correlated-k approach is very popular. Its major weakness is the lack of ways to adapt the spectral resolution of precomputed k-coefficients, making it difficult to distribute a generic database suited for many different applications. Currently, most users still need to access gigantic line lists or high-resolution cross-section tables to compute k-coefficients tables at the desired resolution.

In this presentation, I will show that precomputed k-coefficients can be binned to a lower spectral resolution without loss in accuracy. I will show that this approach compares very favorably with the sampled cross section method. This enables the dissemination of accurate radiative transfer data by providing k-coefficient tables to users who can later tailor those tables to their needs on the fly. To help with this final step, I will briefly present a new public Python library -- Exo\_k -- designed to handle radiative data in many different formats efficiently.

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## References

Leconte et al. 2021 - <https://ui.adsabs.harvard.edu/abs/2021A%26A...645A..20L/abstract>