

ALMA Science

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Jared Anand Crossley - 2023-11-01 - Historical Articles

Channel (spectral or velocity) averaging is done by the task split, while the cvel task only interpolates the data onto a new frequency grid. To achieve both channel averaging and to move the data to a new frequency grid, one must combine split and cvel.

For example, when the interpolation parameter is set to 'linear' cvel will interpolate between the two channels closest in frequency to the center of the new channel. When the interpolation parameter is set to 'cubic' a few additional channels will be used in the interpolation. When the interpolation parameter is set to 'nearest', only the nearest channel is used.

Problems can arise using cvel when the width of a channel in the new frequency grid is large compared to the channel width of the original data (e.g., using cvel to go from a width of 1MHz to 10MHz). In this case the output of cvel will be much noisier than one would expect if using channel averaging (where the noise would decrease by $\sim\sqrt{10}$).

If you wish to average channels prior to regridding, use the task split to average channels and then use cvel to regrid (or vice versa).

Note: The clean task can average channels and regrid as part of the imaging process. In this case, the original data is left untouched; only the imaging products include the effects of spectral averaging and regridding.

Note: In later versions of CASA a new task (mstransform) is being made available. This task is intended to combine the functionality of tasks like split, cvel, partition and hanningsmooth with the addition of a speed boost. As of CASA 4.3 it is still under development and thus results from its use should be carefully inspected.