

How to achieve very high spectral resolution

DiFX can support a wide range of spectral resolutions. Achieving the highest resolutions can be tricky for a number of reasons, many with adverse performance side effects:

- Typically transform sizes get large
- Lots of memory is needed / cache memory becomes less effective
- Bandwidth.time product becomes small (as low as 1), meaning less reduction of data
 - Output data could be larger than input data!
- Individual FFTs become long (in time), butting up against

Some general tips to consider:

- Start with small input bandwidths (e.g., plan the experiment properly!)
- Use factors of 10 in FFT spectral resolution, rather than only factors of 2
 - E.g., set spectral resolution (specRes and fftSpecRes) to 0.001 (MHz) rather than 0.0009765625 (MHz)
- Make sure integration time (tInt) multiplied by specRes is not less than 0.0000001
- Make use of zoom band to only save part of the spectrum, if consistent with the science
- To minimize memory usage, numBufferedFFTs should probably be set to 1 (may greatly hurt performance)

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