Solvent Suppression in VNMRJ with **presat**

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The **presat** pulse sequence provides solvent suppression by coherent saturation of the solvent signal. This usually produces decent results if the peak is not very tall. It is useful when your sample is in a deuterated solvent that also contains some residual protonated solvent. If the protonated solvent is the major component (e.g. 85% H$_2$O/15% D$_2$O) the results are generally unacceptable and a better pulse sequence must be chosen (see below).

Start by shimming as best as you can (gradient shimming might help!) and take a routine spectrum. A good lineshape with symmetrical peaks is essential. After this type **presat** in the Inovas or **Presat** in the Mercury 300. The macro sets acceptable values for the parameters used in the pulse program except for **d1** which should be zero. Put the cursor on the signal you want to eliminate and type `sd satfrq=dof`.

Basically, there are two parameters that can be changed in order to obtain better results. The power used for irradiation, **satpwr**, can be adjusted from about -15 to +10. The default value of 2 is a good starting point. Decrease the power if you need better selectivity, for example, to see signals close to the solvent. Increase the power to obtain more suppression; however, never use more than 10 as it can damage the hardware.

Saturation is not instantaneous, it takes between 1 and 5 seconds or more depending on the solvent. The saturation delay, **satdly**, is the length of time during which the solvent is going to be irradiated. Again the default value of 1.5 s is a good starting value, but you may obtain a cleaner suppression if you increase **satdly** to 3 or 5 and decrease **satpwr** by 3 or 6 units.

Sometimes, enabling a steady state pulse in the sequence can help to obtain a cleaner suppression. It can be enabled with `sspul='y'` but try it only if you don't get acceptable results with its default value of 'n'.

There are a few other pulse sequences available for solvent suppression on the Varian instruments: **wet1d**, **binom**, **jumpret** for example. For samples with high water content, the **wet1d** pulse sequence is one of the best choices available.