**DSP** **FILE HEADER (one per FILE)**

boot: 0L, $ ;type of boot (0=EPROM)

tag: 0L, $ ;number of processors

acq\_period: 0L, $ ;number of machine cycles between acquisitions

acq\_delay: 0L, $ ;number of machine cycles before the first acquisition

acq\_apert: 0L, $ ;number of samples per acquisition

fft\_dist: 0L, $ ;number of overlap samples

**fft\_points: 0L, $ ;number of FFT points (256 or 1024)**

spec\_pre: 0L, $ ;number of pre-integrations

spec\_post: 0L, $ ;number of post-integrations

spec\_burst: 0L, $ ;number of spectra per burst-DMA via the VME-bus

mode\_comp: 0L, $ ;compression type

**mode\_acq: 0L, $ ;number and type of channels (1,2 or 3)**

irq\_vector: 0L, $ ;interruption vector defined in vmeplus.conf

**start\_time: 0L, $ ;start time**

host\_int: 0L, $ ;number of integrations on the station

**millisec: 0L, $ ;duration of a spectrum in milliseconds** **(integer part)**

**FLow: 0L, $ ;frequency of the spectrum point 0 in Hz**

**FHigh: 0L, $ ;frequency of the spectrum point 1023 (or 255) in Hz**

microsec: 0L, $ ;fractional part of the spectrum duration

19 Long (32) – ;not used

**Total length of DSP FILE HEADER is 64 LONG[32] words (256 byte)**

**SPECTRUM HEADER No1 (one per spectr)**

error: 0L, $ ;error code of SHARC

**count: 0L, $ ;number of the spectrum (in the current file)**

pId: 0L, $ ;number of processor

pTag: 0L, $ ;identifier of the processor

**spcount: 0L, $ ;absolute spectra counter (from the beginning of observations)**

empty: lonarr(11) ;not used

**Total size of one spectrum header is 16 LONG[32] words (64 byte)**

**SPECTRUM DATA No1**

**a: fltarr(1024), ;power spectrum input 1(2) (channel 1)**

# Total length of one instant spectrum in 1 channel mode is 1024 LONG[32] words (4096 byte)

The file starts with the **Header (256 byte)**, then N samples follow. Each sample (let’s say spectrum) consists of its own small header and the data block.

If the DSP Mode equals 1 or 2, there is only one data field in the file (not four, as it is in DSPZ). And the data block consists of N data samples of the form

**[Spectrum header (64 byte)+data(4096 byte] 1, [Spectrum header (64 byte)+data(4096 byte)] 2, … [Spectrum header (64 byte)+data(4096 byte)] N.** So for one individual spectrum 1024 FFT points (float numbers) are stored in a row, one after another.

As for mode 3, the structure of old DSP is different from the DSPZ.

[Spectrum header (64 byte)+[data\_A (4096 byte)] + [data\_B (4096 byte)]+ [Data\_Re (4096 byte)]+[data\_Im (4096)].

The difference between old and new DSPs is the order of data storage.

In Old DSP first the whole spectrum of the channel A is stored (all 1024 points in a row), then the spectrum of the channel B is stored, then the real and imaginary parts of the cross correlation are stored (1024+1024 float numbers).

In DSPZ we write the first FFT point of the spectrum A, then the first point of spectrum B, then the first point of real part and finally the first point of imaginary part of cross correlation. After this the second FFT point is stored in the same way.

Since the mode of DSP in data you got is 1 (I’m pretty sure it is), you only have to read N samples, which are 1024\*4+16\*4=4160 byte each, remove the header in each sample and get pure data (N spectra 1024 float numbers each).