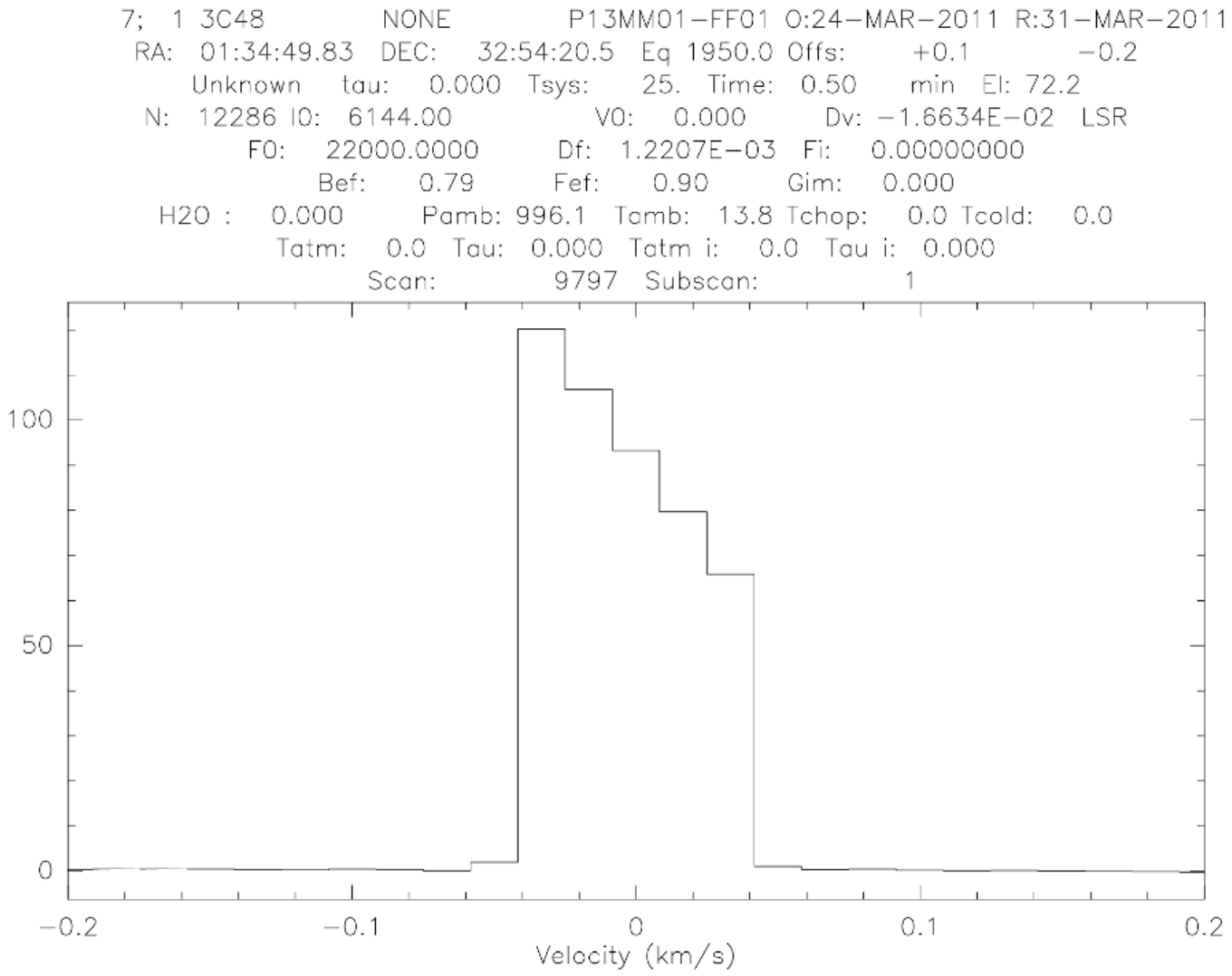
When using the FFTS backend, one should avoid the very center of the spectrum (i.e., spectral channels 8190 to 8194). Spectral lines in these channels are distorted; see Figure. It is very easy to apply countermeasures - either by choosing a slightly different frequency in the receiver setup, or by defining an appropriate source velocity in the FSWITCH/PSWITCH setup.



The reason for this specific behavior is the following:

The Acqiris-FFTS Hardware involves two interleaved ADCs to reach the total Nyquist bandwidth, e.g. 500 MHz. To do the interleaving proper, we have to adjust both ADCs in gain, offset and phase (180 degree). The result is typically a spike (a narrow line) in the center of the bandpass because you can't do the interleaving perfect or you have to adjust the ADCs frequently. Thus, the center channel is not usable for observations. In many observations, we measure broader lines, so we can ignore this problem of the center channel. Hence, we set the center channel to the arithmetic mean of the left and right channel besides the center. And that's the reason why you observe this behavior. My recommendation for observations of very narrow lines is to measure with a velocity offset to move the line a bit out of the center. We will install a new FFTS – the XFFTS – in Effelsberg in the next weeks. This XFFTS is able to process bandwidth up to 2.5 GHz with 32K channels. In this system we interleave 4 ADCs but not on separate chips. In Effelsberg related applications, we will use just one of the four ADCs. So the spectrum will be free of "the center problem". (Bernd Klein, priv. comm., 2011)