FIRST DIGITAL OBSERVATION WITH THE DUERNTEN
RADIO SPECTROGRAPH

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The solar radio spectrograph under construction at ETH can observe in
the frequency band 100-1000 MHz. The digitized version measures up to 2000
frequency points per second with a bandwidth of 1 MHz. In its test operation
in December 1974 the frequency was swept between 235-435 MHz six times
per second.

Figure 1 shows film registrations of the 1974 December 14, 1021 UT event,
consisting of several groups of type III bursts with one type V burst. In figure 2
the frequency profile of the digital registration of the section from 1021.06 to
1021.16 UT between 235 and 303 MHz is shown. Intensity is in a logarithmic,
arbitrary scale (to the right). The quiet level has been substracted, but the uneven
sensitivity has not yet been calibrated. Many spikes (e.g. at 248 MHz) are local
manmade disturbances due to the provisional location in the city of Zurich.

Figure 3 represents selected time profiles of the type III/V event, again
with logarithmic intensity scale. The peaks at 1021.42.7 on 302 and 312 MHz
are manmade interference.

In figure 4 the film registration of an event is shown for which the possi-
bility of having a type III/V event with a "negative type III" reducing part
of the continuum had to be considered. However, the time profiles in figure 5
show clearly that the apparent continuum is composed of type III bursts and
the suspected reduction is just a gap between subsequent bursts. This agrees
with Weissensau observation (H. Urbanz, private communication).

The description of the instrument as well as calibrated data will be pub-
lished elsewhere.

The radio spectrograph is built under the supervision of Dr. H.K. Asper,
B. von Arx and Ch. Zehntner have contributed to the construction, and A.
Paschke has helped to reduce the data. The project is financed by the Swiss
National Science Foundation and operated by ETH Zürich.

Fig. 1
Dynamic spectrum of type III and V solar radio bursts.

Fig. 2
Intensity vs. frequency along single sweeps.
Fig. 3
Intensity vs. time plots for selected frequencies.

Fig. 4
Dynamic spectrum of type III solar radio bursts (intensity maximum about 400 s.f.u.).
Fig. 5
Intensity vs. time plots for selected frequencies (corrected for finite sweep speed).