

SOLAR RADIO BURSTS

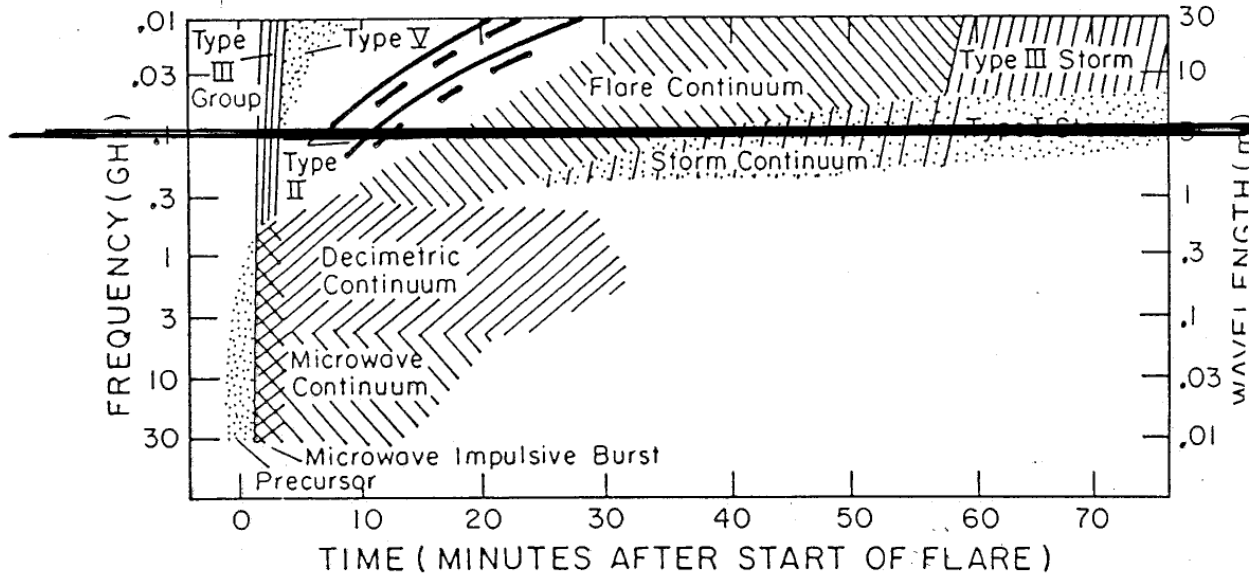


Figure 11 Schematic dynamic spectrum of a solar radio outburst such as might be produced by a large flare. Outbursts often vary considerably from this "typical spectrum."

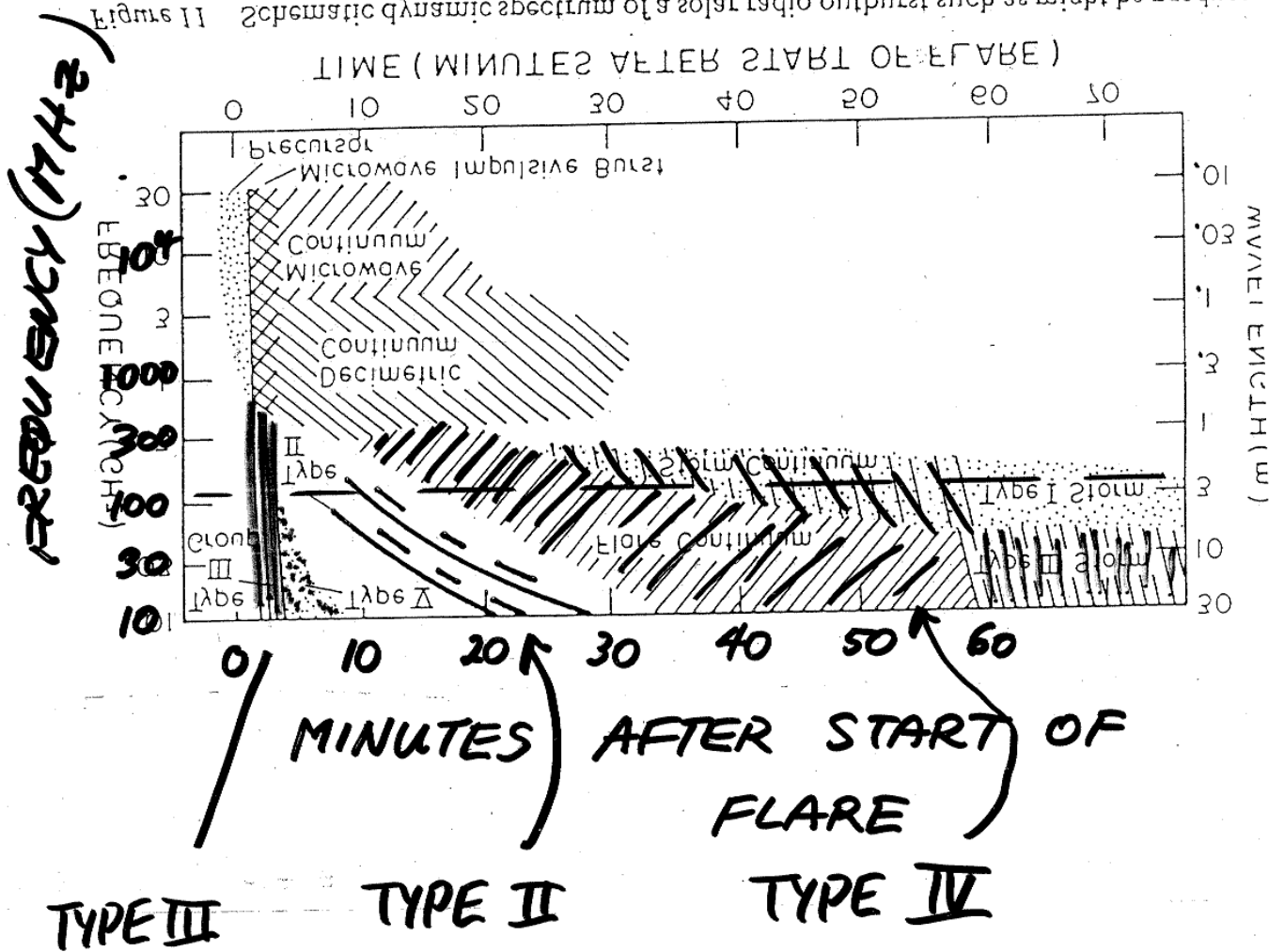
DUIK (1985) *Ann. Rev. Astron. Astrophys.*

BASTION et al. (1998) "

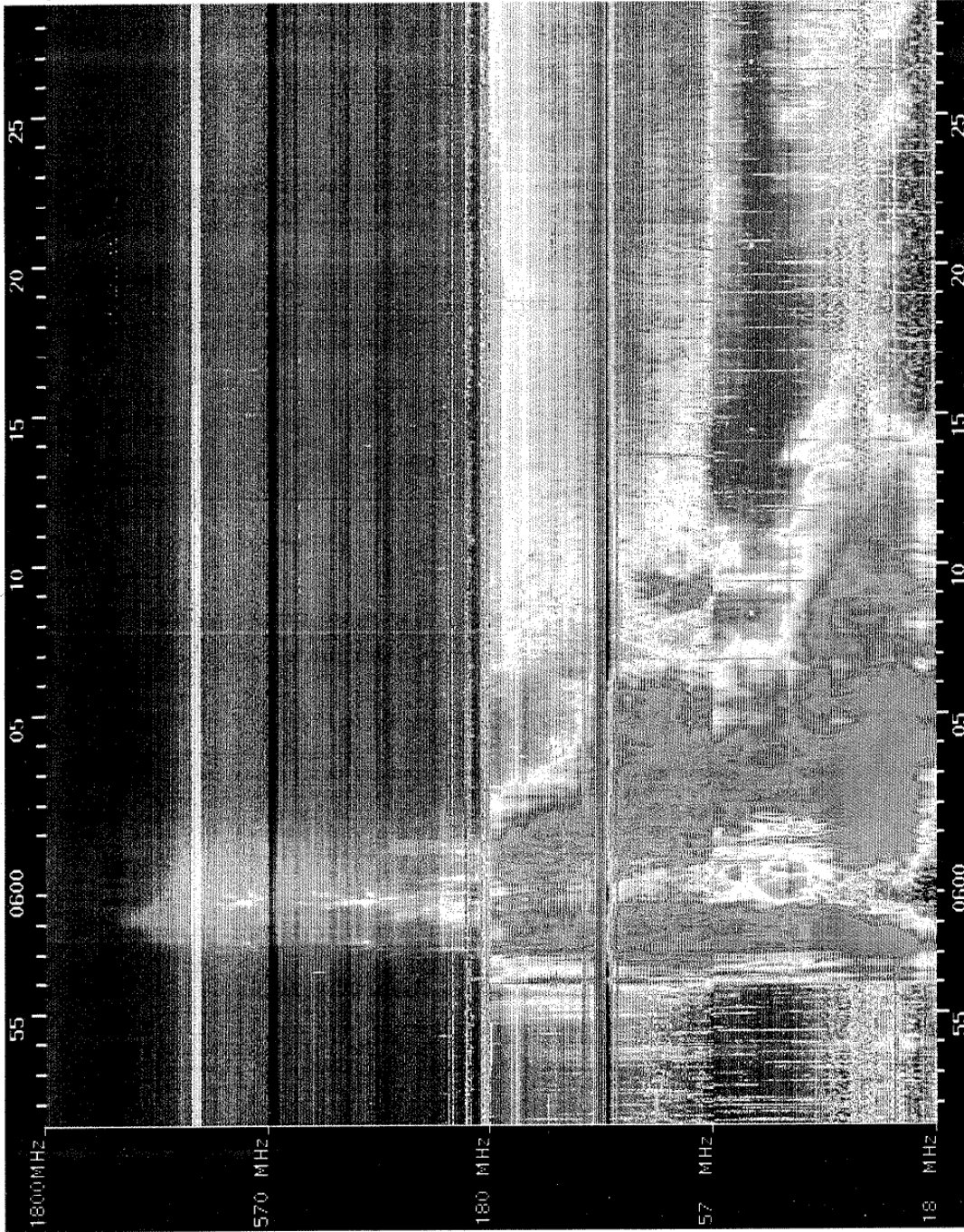
KUNDU (1965) "Solar Radio Astronomy
Wiley

KRÜGER (1979) "Introduction to Solar
Radio Astronomy + radio physics"
Reidel

ply a large flare. Outbursts often vary considerably from this "typical spectrum".
 Figure 11 Schematic dynamic spectrum of a solar radio outburst such as might be produced



CULGOORA SPECTROGRAPH



570

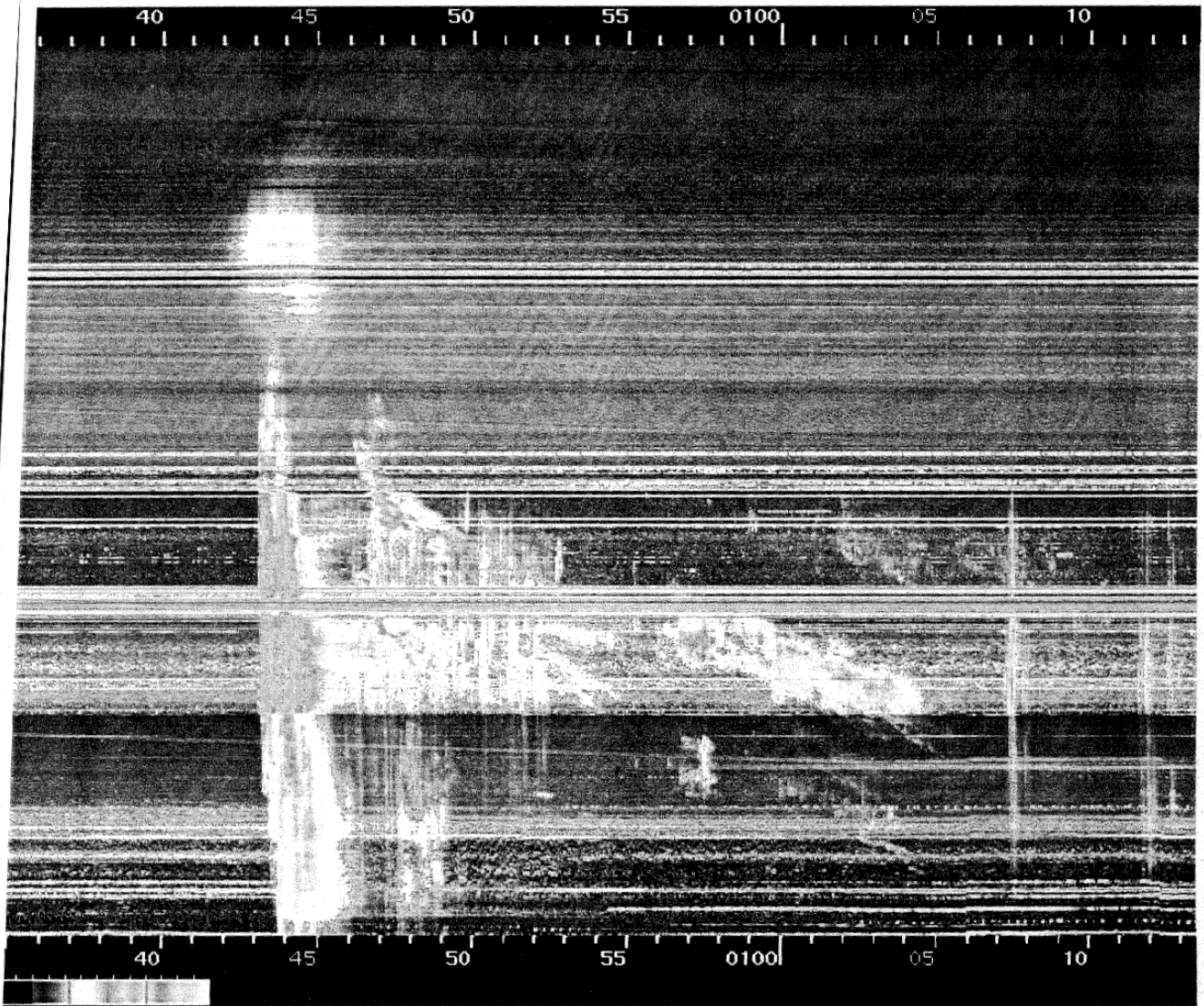
180 MHz

57

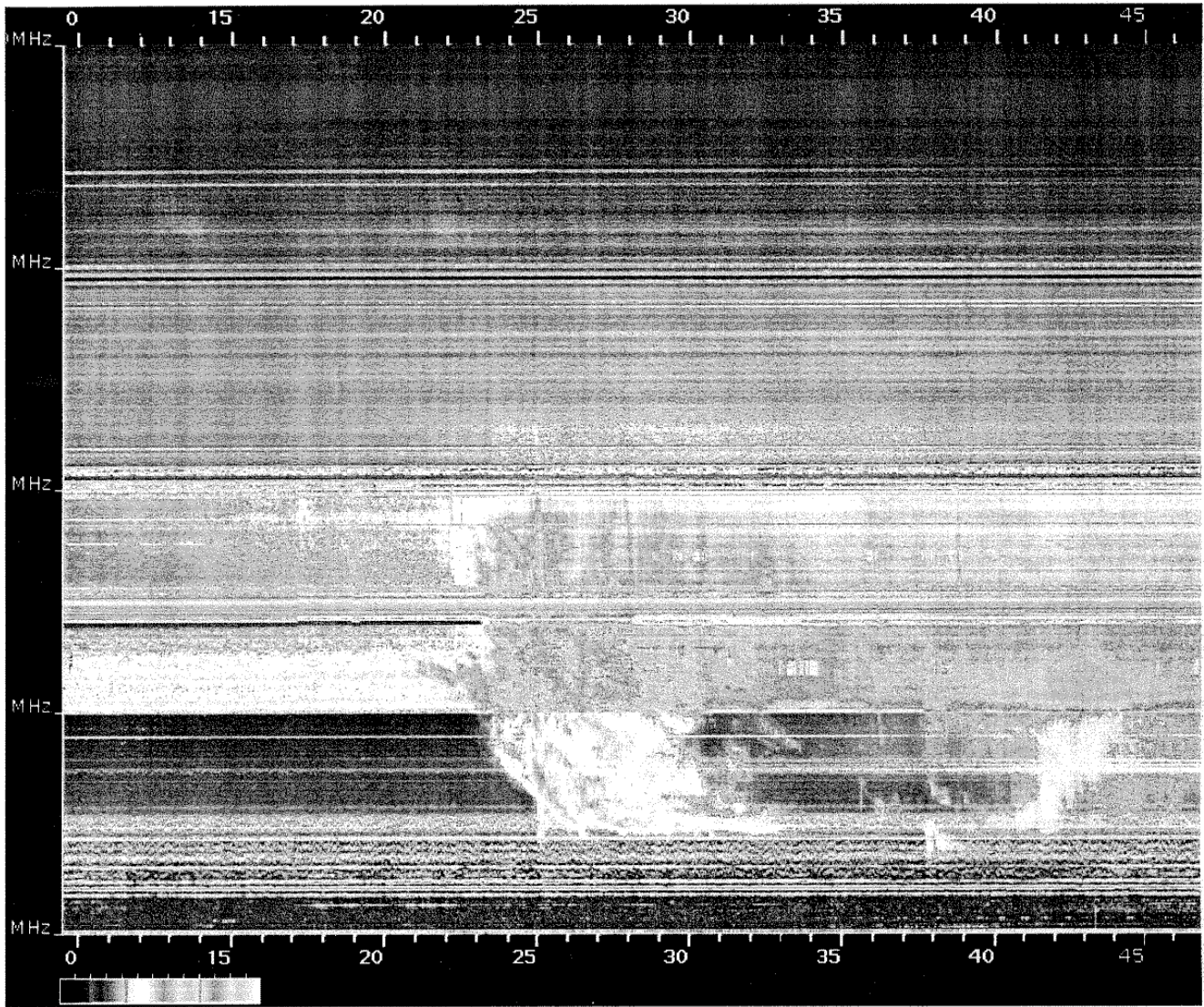
18

MINUTES

7/24/01



Dec 28 1999

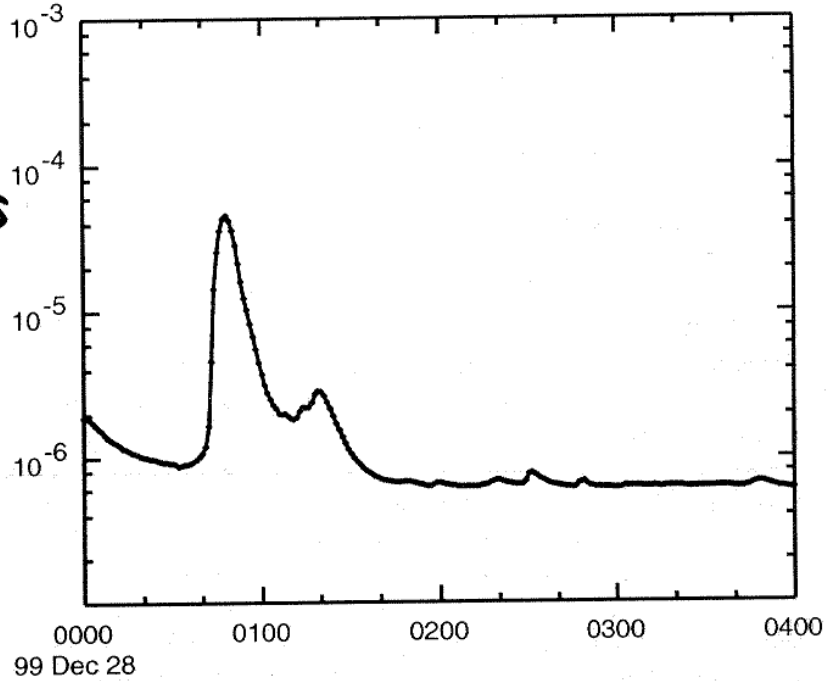


2100UT

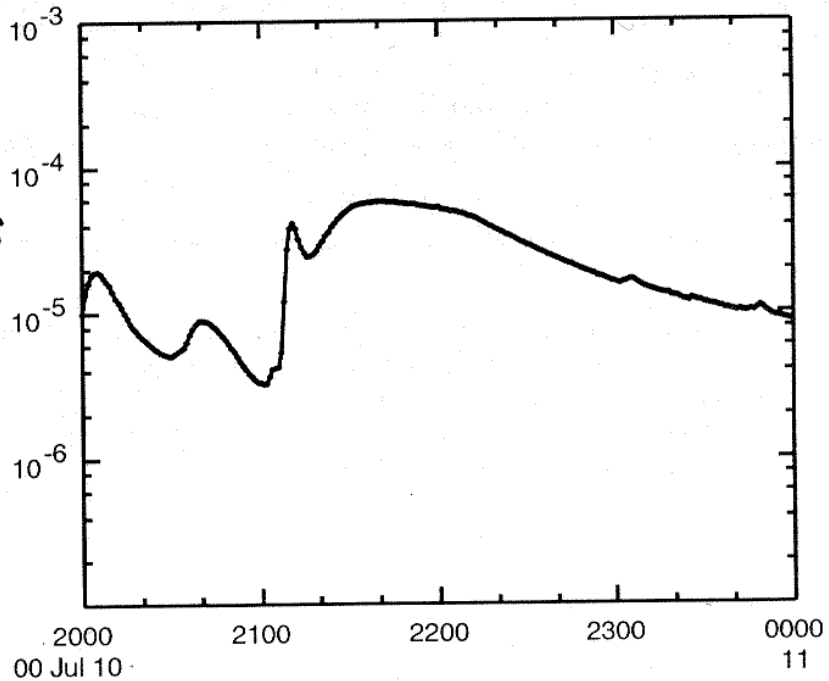
Jul 10, 2000

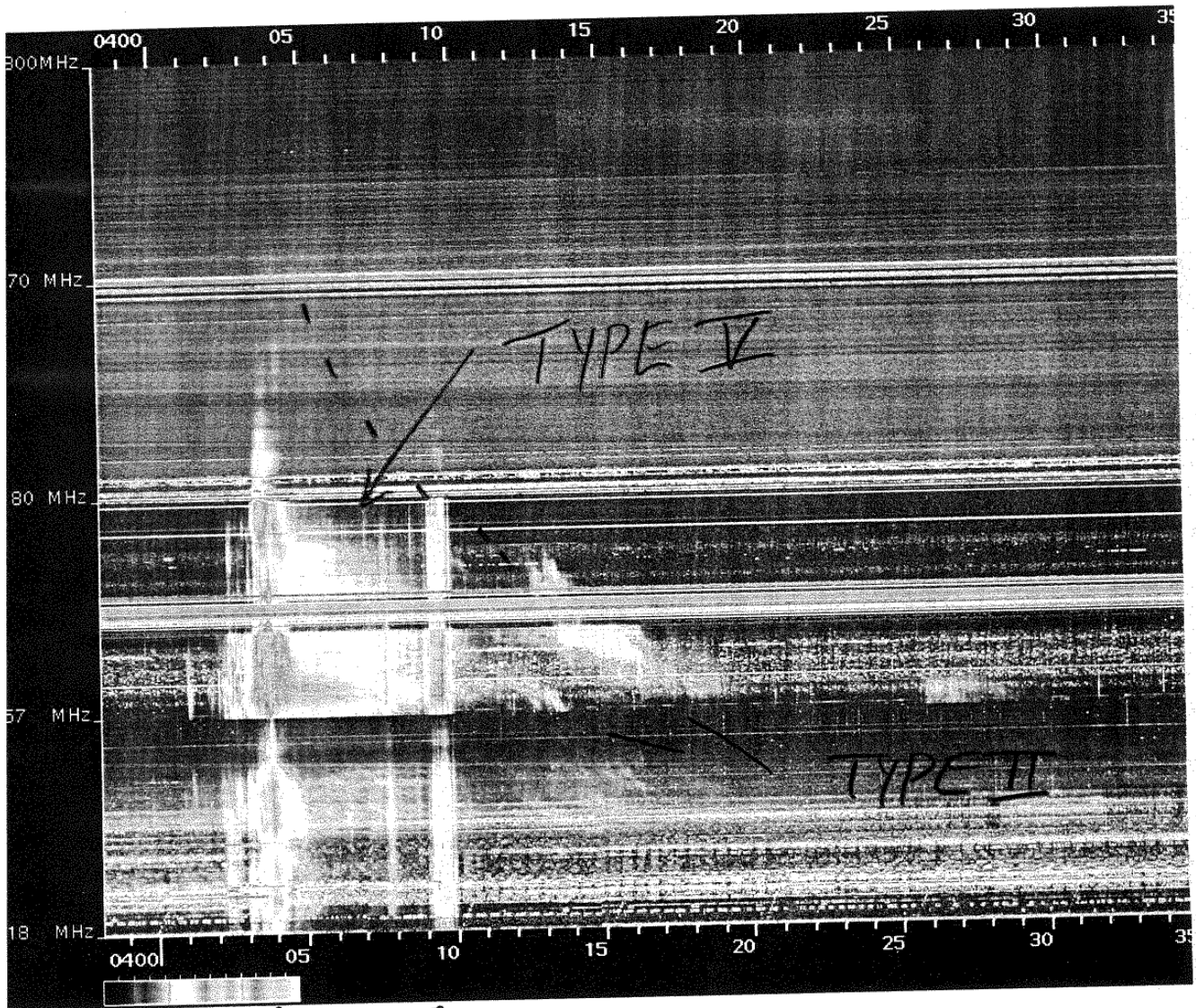
1-8Å SOFTXRAY INTENSITY

IP ELECTRONS
SMALL CME
γ-RAY LINES?



IP PROTONS
LARGE CME

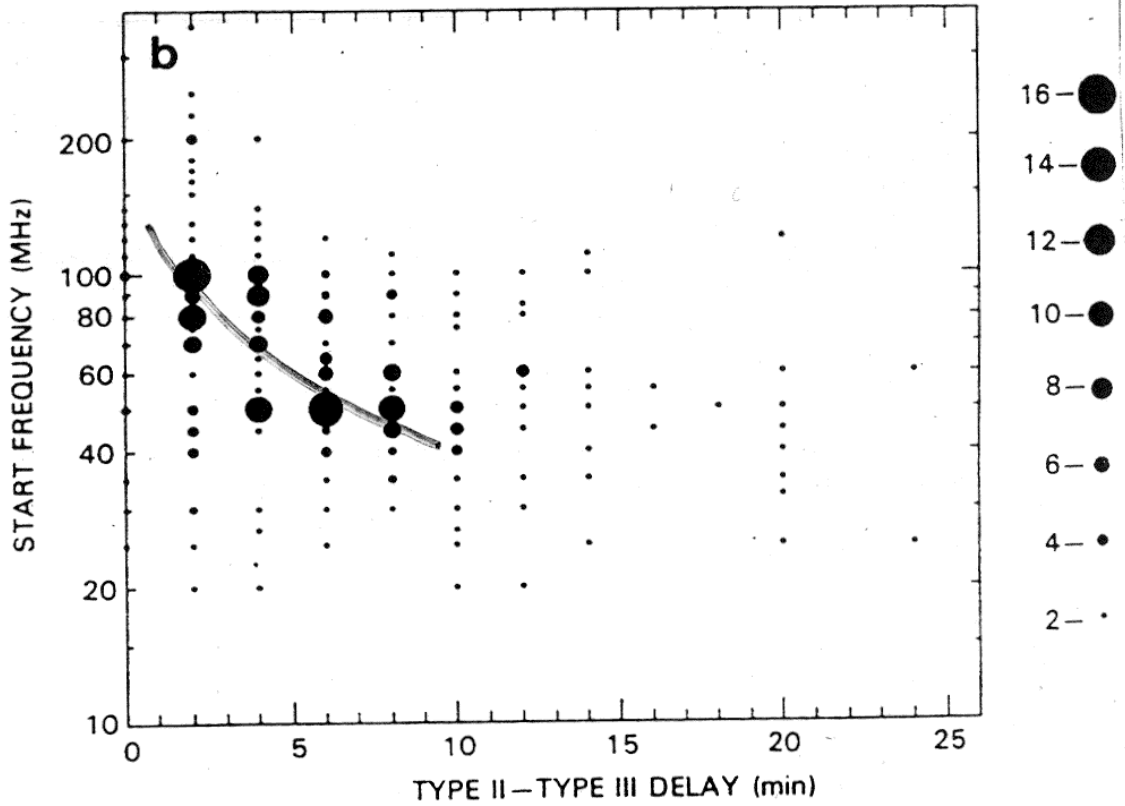
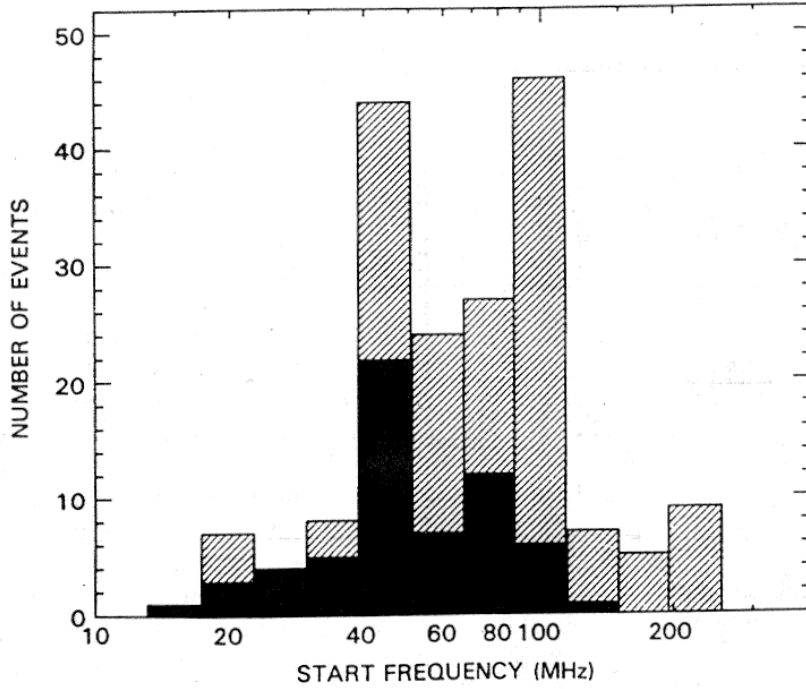




↑ ↗
TYPE III

IS TYPE IV ON CLOSED FIELD
LINES ?

CANE + REAMES (1988)



STARTING FREQUENCY VS DELAY

Cane (1985)

AVERAGE PEAK INTENSITY

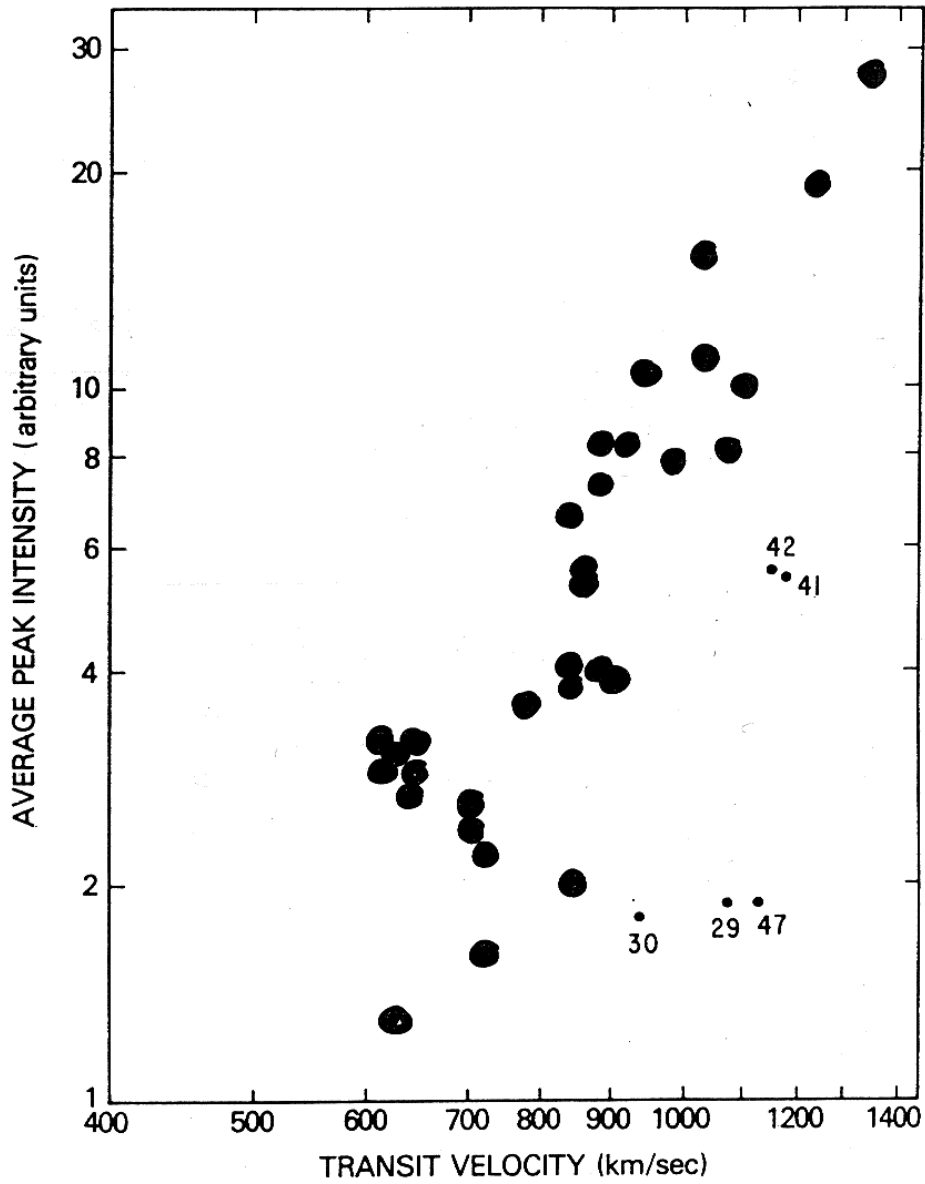
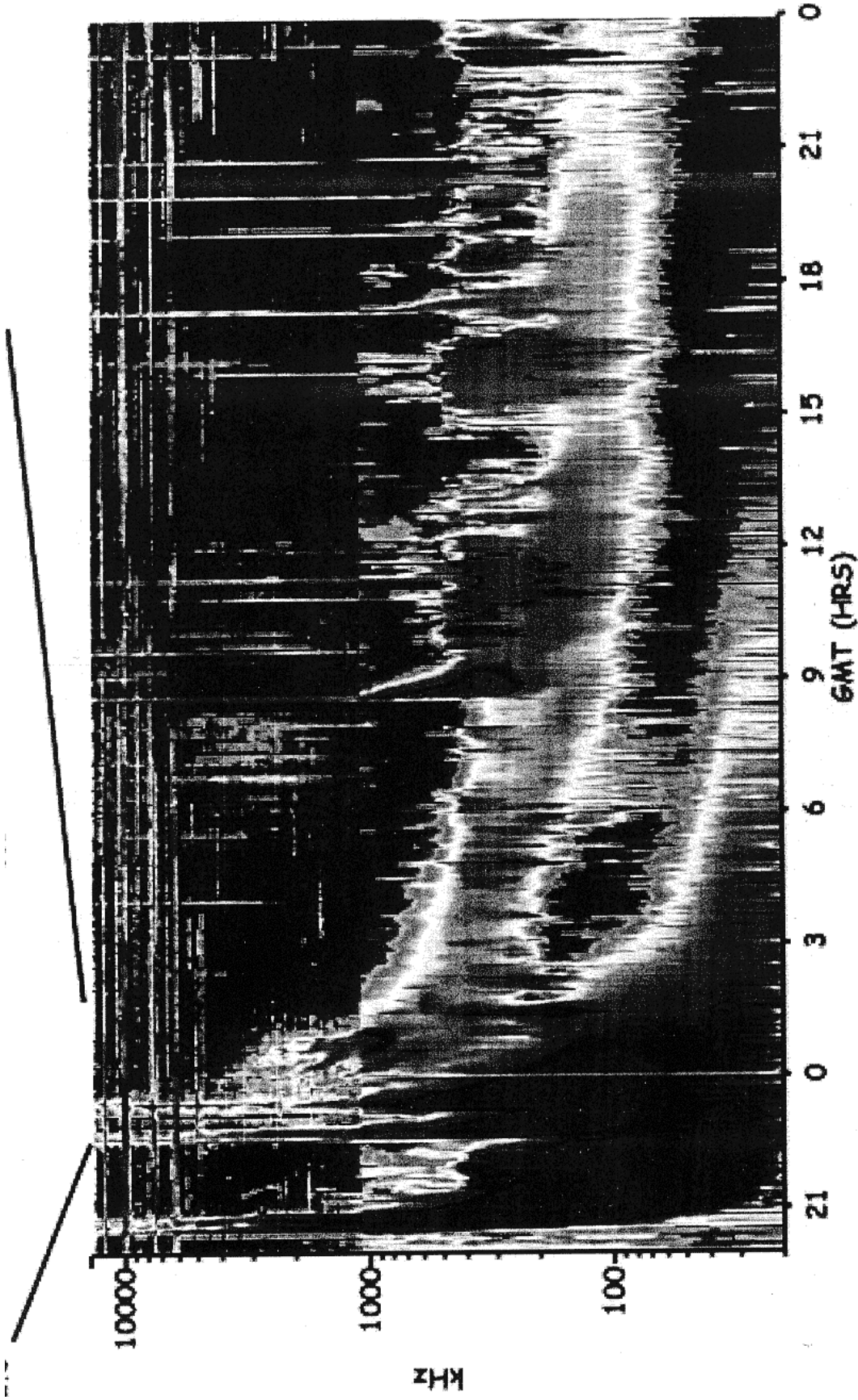


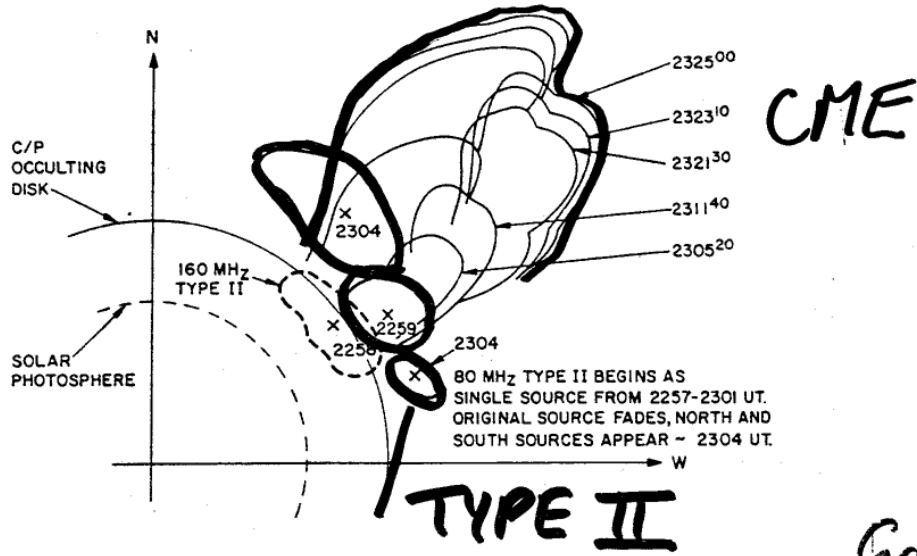
Fig. 5. Variation of radio intensity with shock transit velocity. The numbers refer to events in Table 1.

TRANSIT SPEED (km/sec)



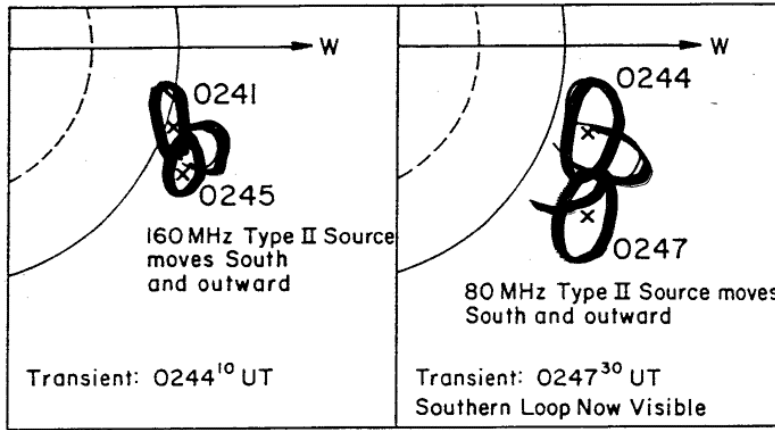
5 10 15 20
Intensity (dB) relative to background

IP Type II event



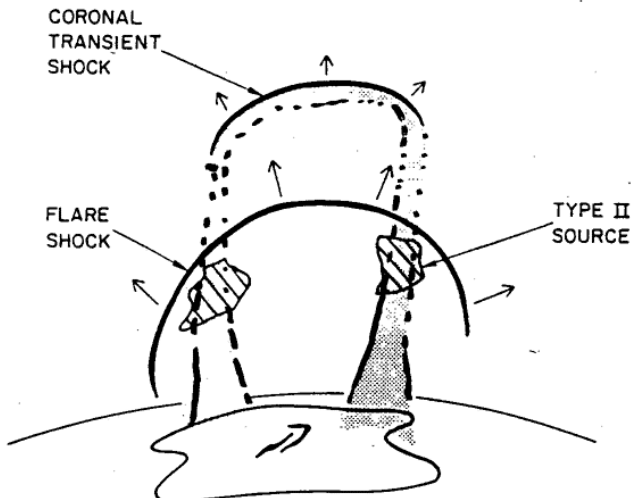
1980 JUNE 29

Gary et al.
(1983)

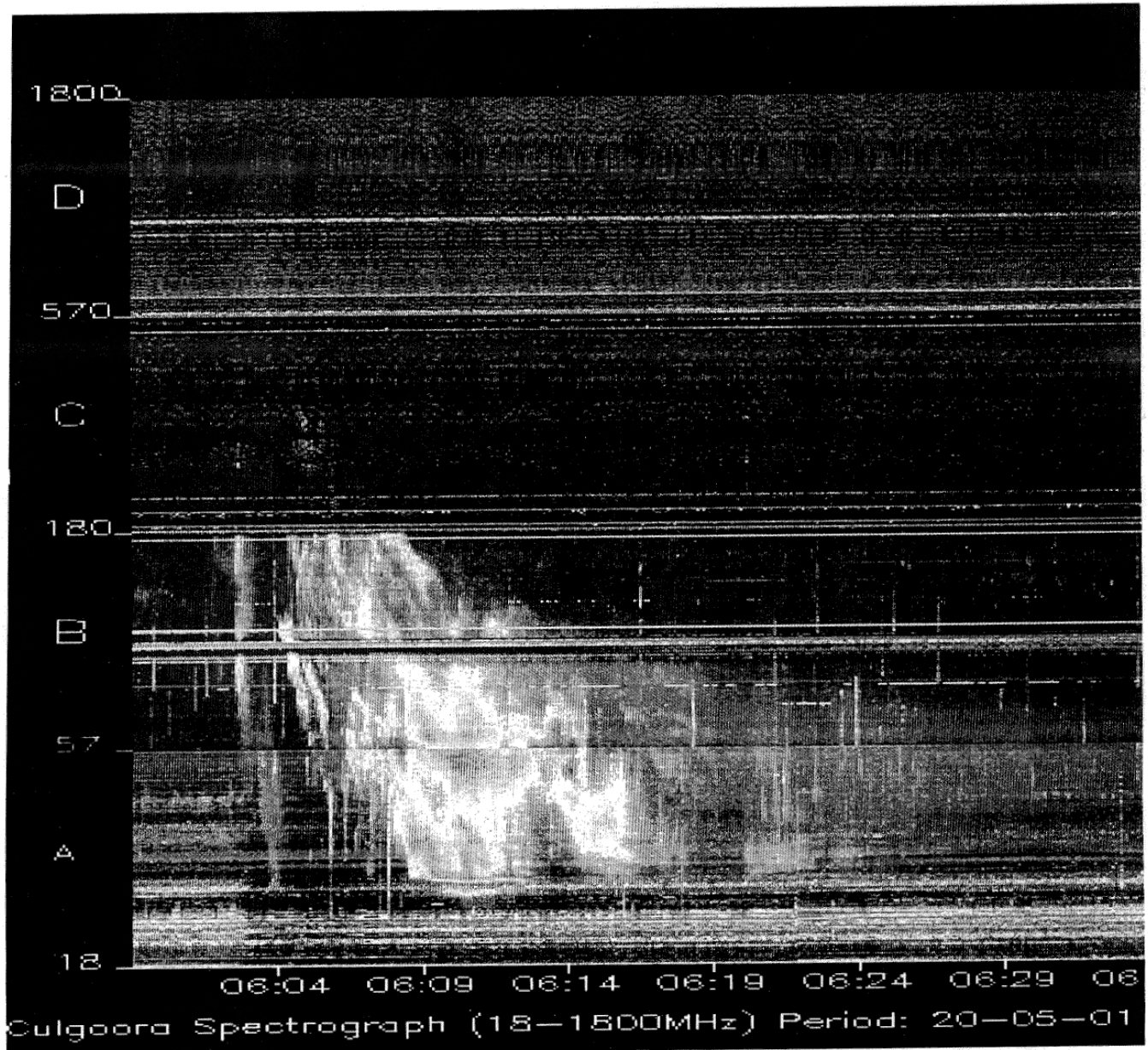


138

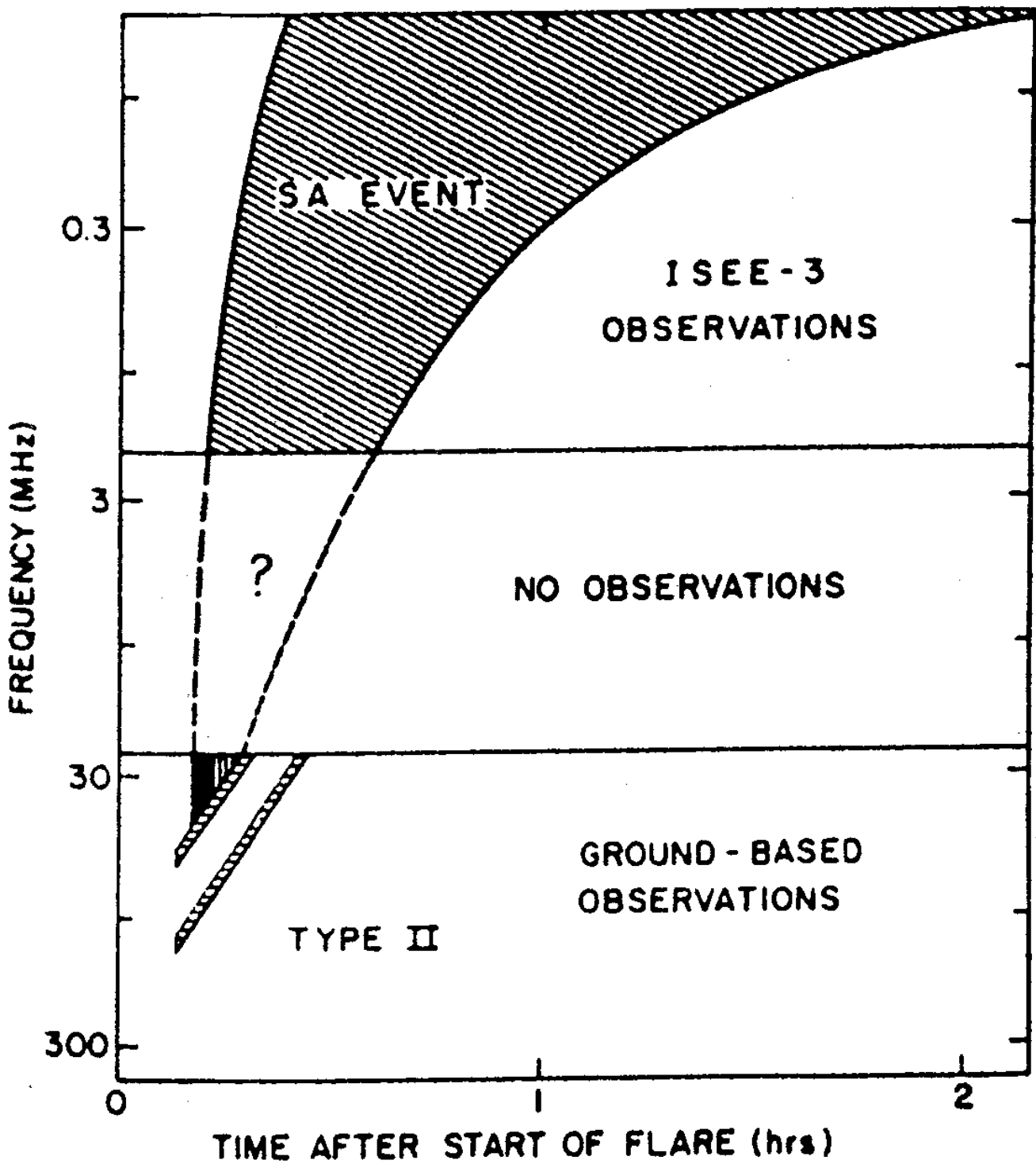
Wagner +
MacQueen
(1983)



WHAT CAUSES CORONAL TYPE II BURSTS ?



WHAT HAPPENS AT LOWER
FREQUENCIES ?



OLD IDEA CANE et al. (1981)

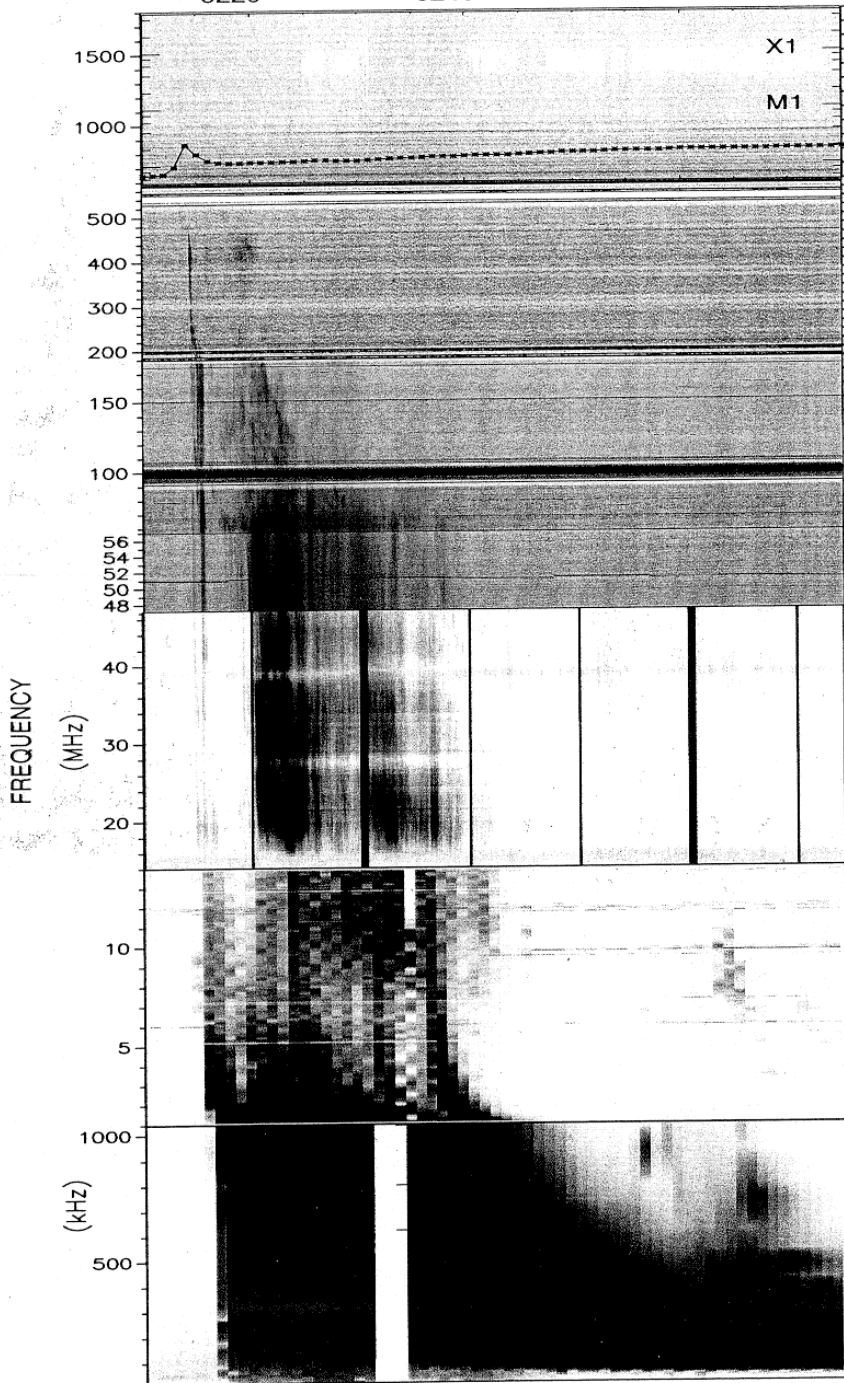
TYPE III-e

2001/04/18 02:10 UT

0220

0240

0300



CULGOORA

BIRS

WAVES

from Cane, Erickson + Prestage

JGR
(in press)

WHY ARE TYPE III- ℓ

IMPORTANT?

NECESSARY & SUFFICIENT

FOR SOLAR ENERGETIC PARTICLES

QUESTIONS

(FOR FASR)

What is the relationship between impulsive + gradual phases when both occur (+ both non-thermal) ?

What is the source region for type III-l bursts.