

A Large Scale Flare with Multi Sources on March 16, 1989

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Energy release mechanism of the flare

- ① Single loop?
- ② Multi loops?

Gradual Hard Burst

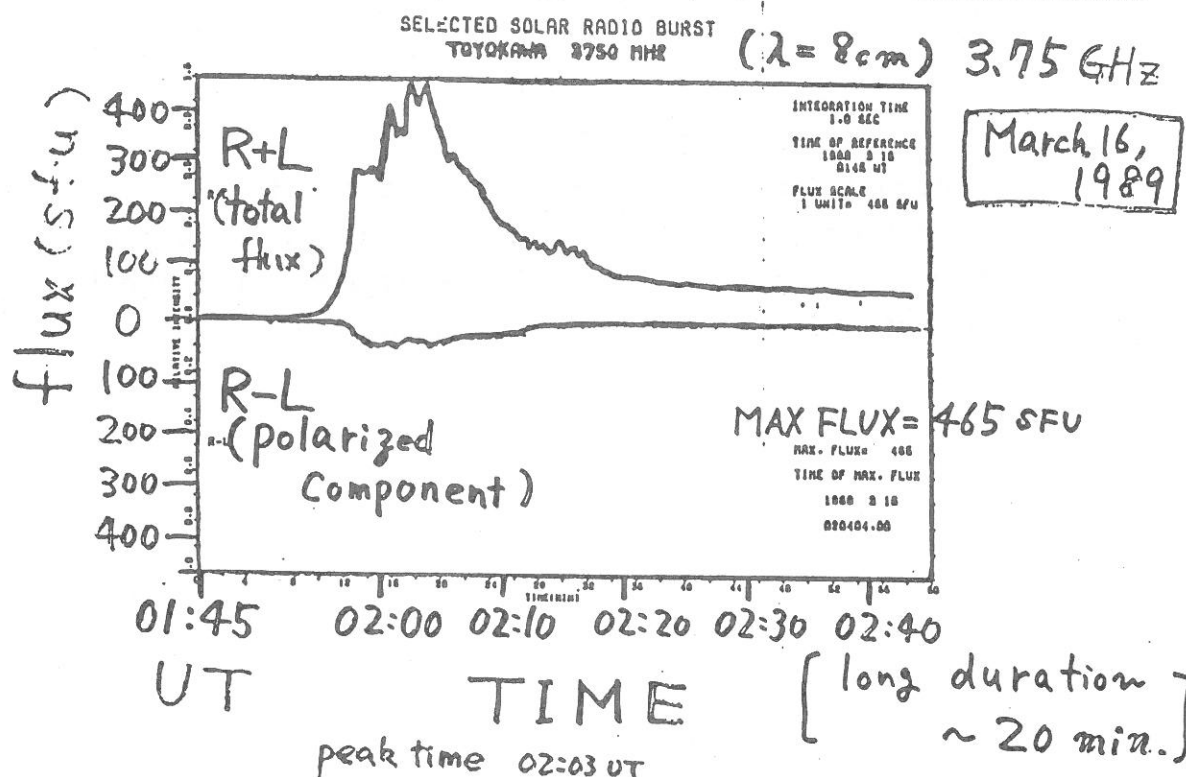
example

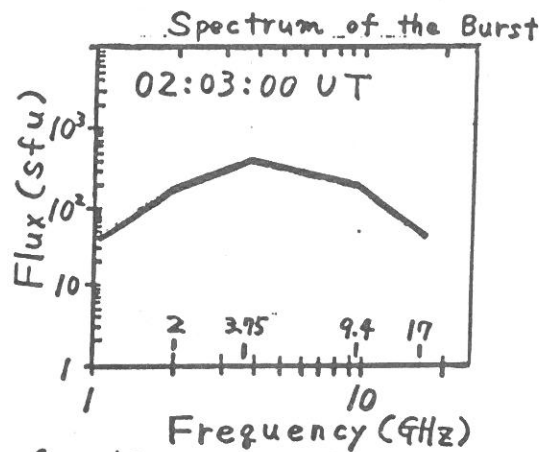
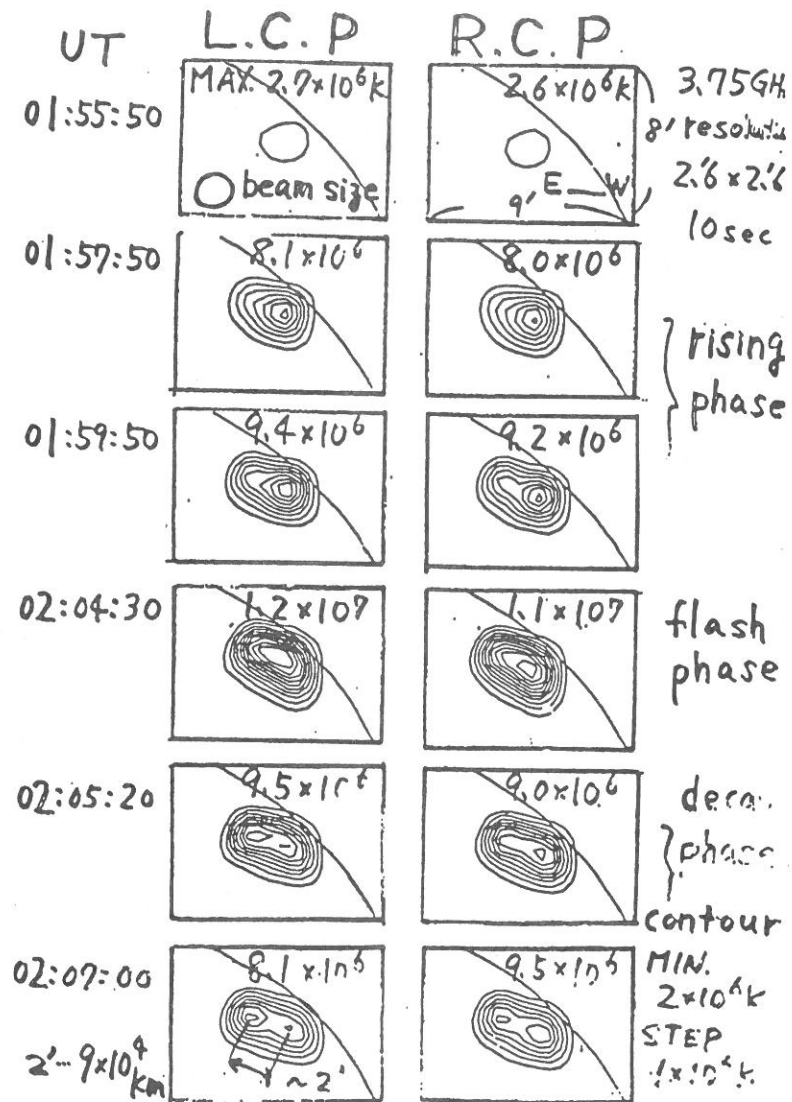
- ① ... May 13, 1981 [Tsuneta et al.]
- ② ... March 16, 1989 28cm Toyokawa
Radioheliograph

• Some characteristics

• Interpretation

Time Profile of the Burst at 3.75 GHz

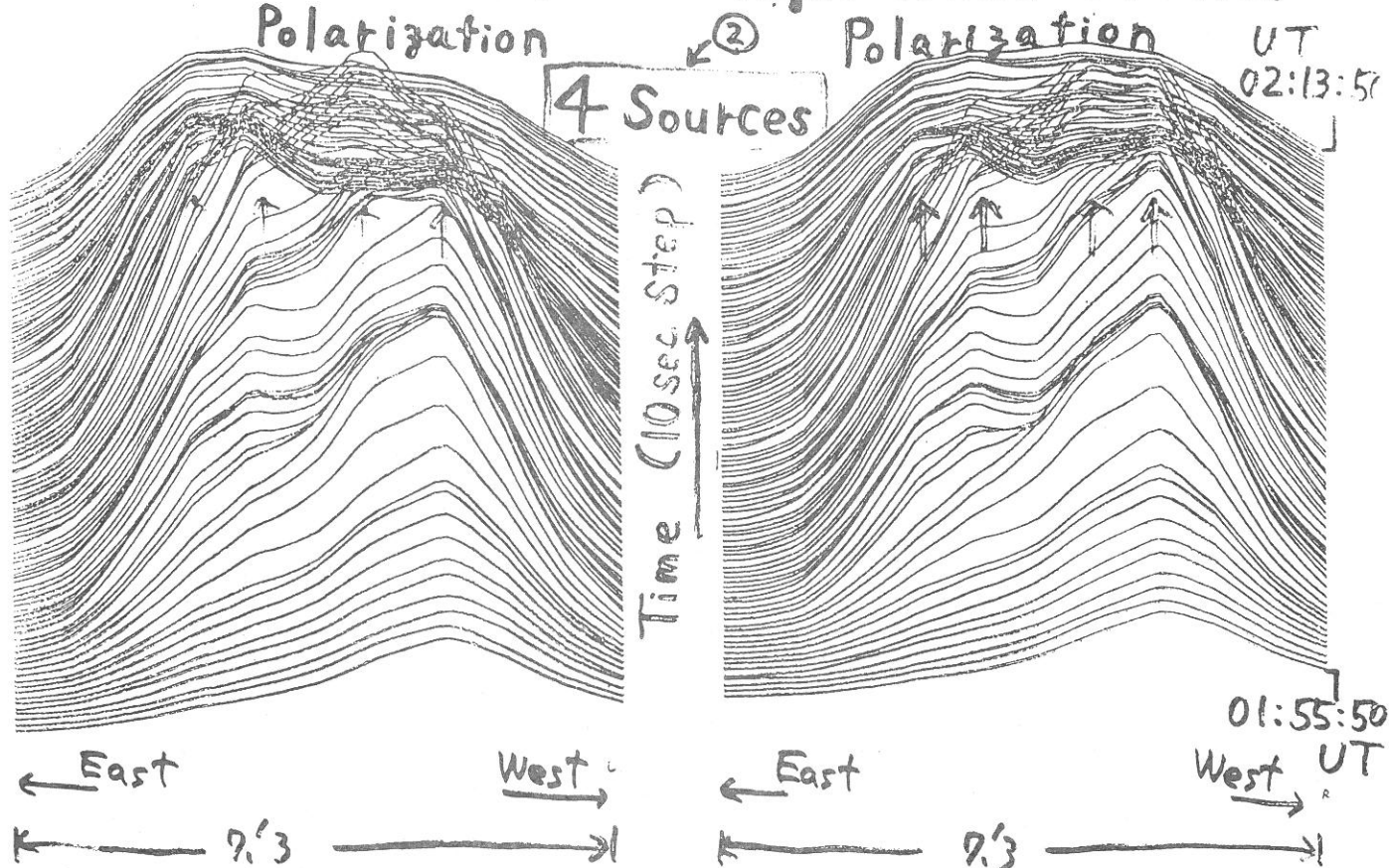




- ① turn over frequency
(weak magnetic field) 3.75 GHz
- ② wide band width
(energetic electrons)
- ③ long-enduring event

⇓
Gradual Hard Burst ... ①

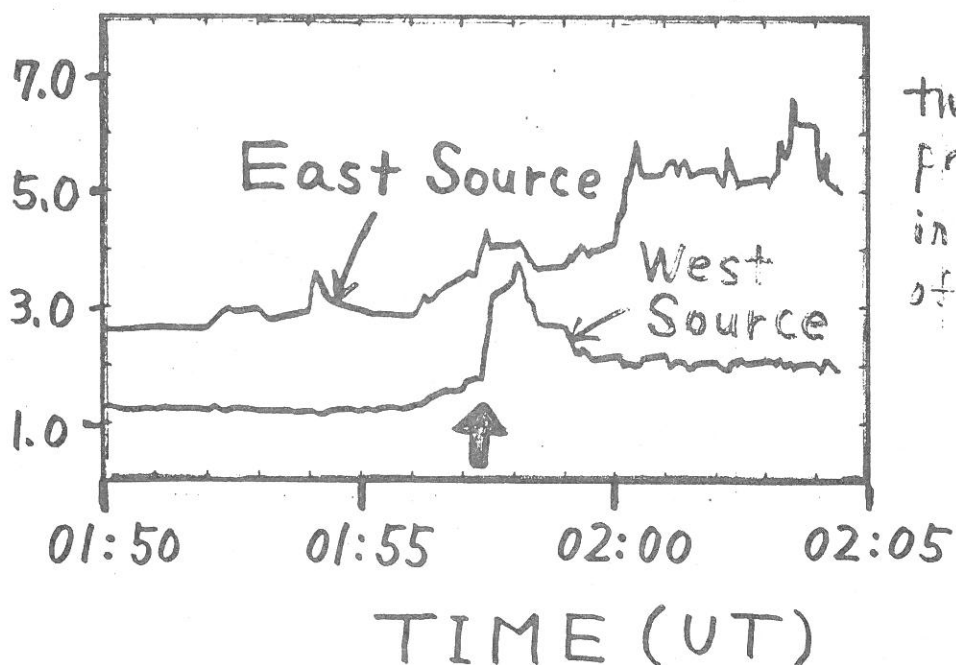
1 Dimensional Scan Produced from 2 Dimensional Map
 Left Hand Circular Polarization Right Hand Circular Polarization



temporal resolution 4 sec.

Total Intensity 176Hz

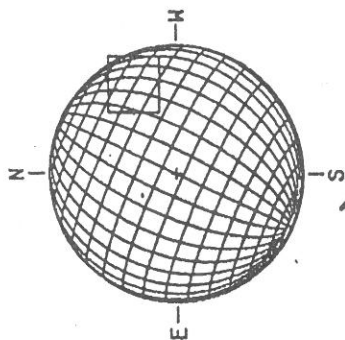
Relative Brightness
 Temperature



two time profiles coincide in time accuracy of 4 sec. - ④

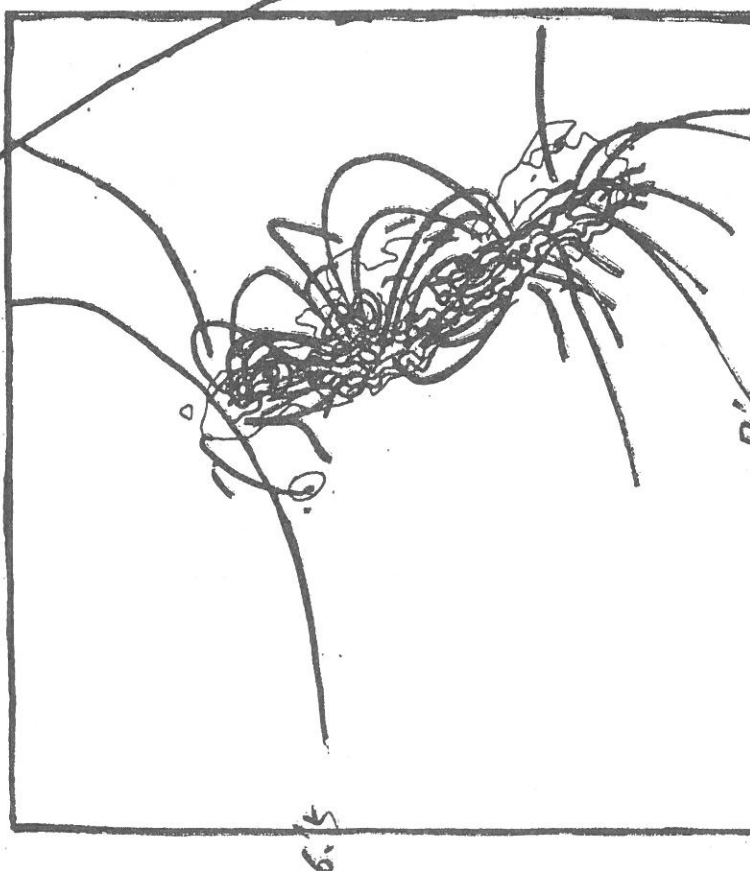
OKAYAMA OBSERVATORY VECTOR MAGNETOGRAM

FILE-10 : MI316A
 DATE : 89/ 3/16
 TIME(JST) : 11 10 54 -12 56 48
 (UT) : 2 10 54 - 3 56 48
 XS= 457 YS= 128
 DX= 6 DY= 6
 NX= 70 NY= 65
 P = -24.6
 B0= -7.1
 R = 957



Contour

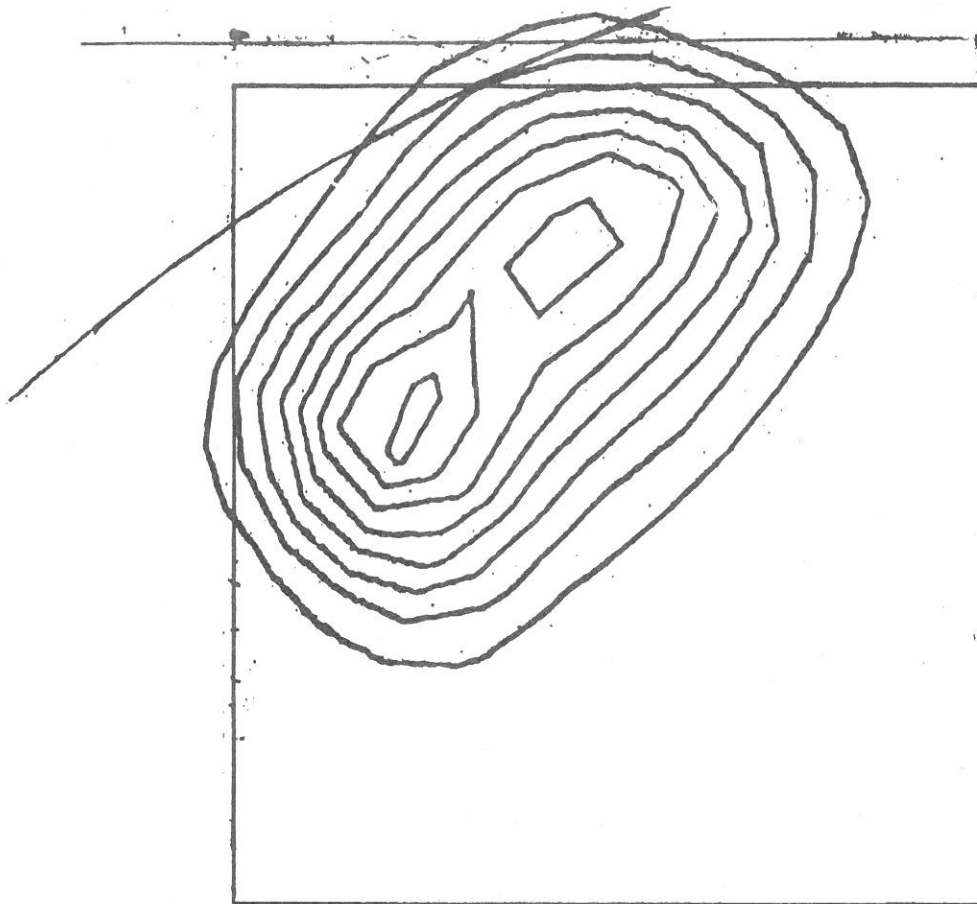
N.S 200,300,400,500,600,700,2000, 9000



SUNSPOT March 15 23:45 UT red line ... N
 magnetogram March 16 blue line ... S
 02:10:54 - 03:56:48 UT

The sources are located in the top of the loops.

3



UT 02:06:10 L

OKAWANA OBSERVATORY VECTOR MAGNETOGRAM

The sources are located in the top of the loops.

FILE-10 : M1316A

LATE : 89/ 3/16

TIME(JST) : 11 10 54 -12 56 48

(UT) : 2 10 54 -3 56 48

XS= 457 YS= 128

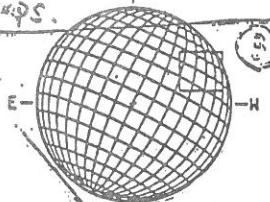
DX= 6 DY= 6

NX= 70 NY= 65

P = -24.6

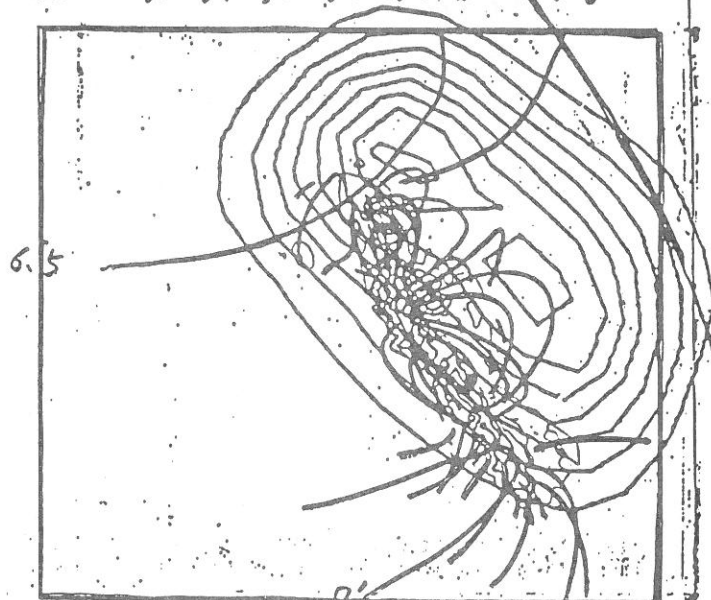
BO = -7.1

R = 957



Contour

N, S 200, 300, 400, 500, 600, 700, 2000, gauss



Sun Spot March 15 23:45 UT red line ... N

magnetogram 02:06:10 L blue line ... S

March 16

02:10:54 - 03:58:48 UT

Conclusion

Burst on March 16, 1989

- ① Gradual Hard Burst
- ② There were 4 sources.
- ③ These sources were located in the top of the loops.
- ④ The time profile for east source coincided with that for west source in time accuracy of 4 seconds.

Interpretation

