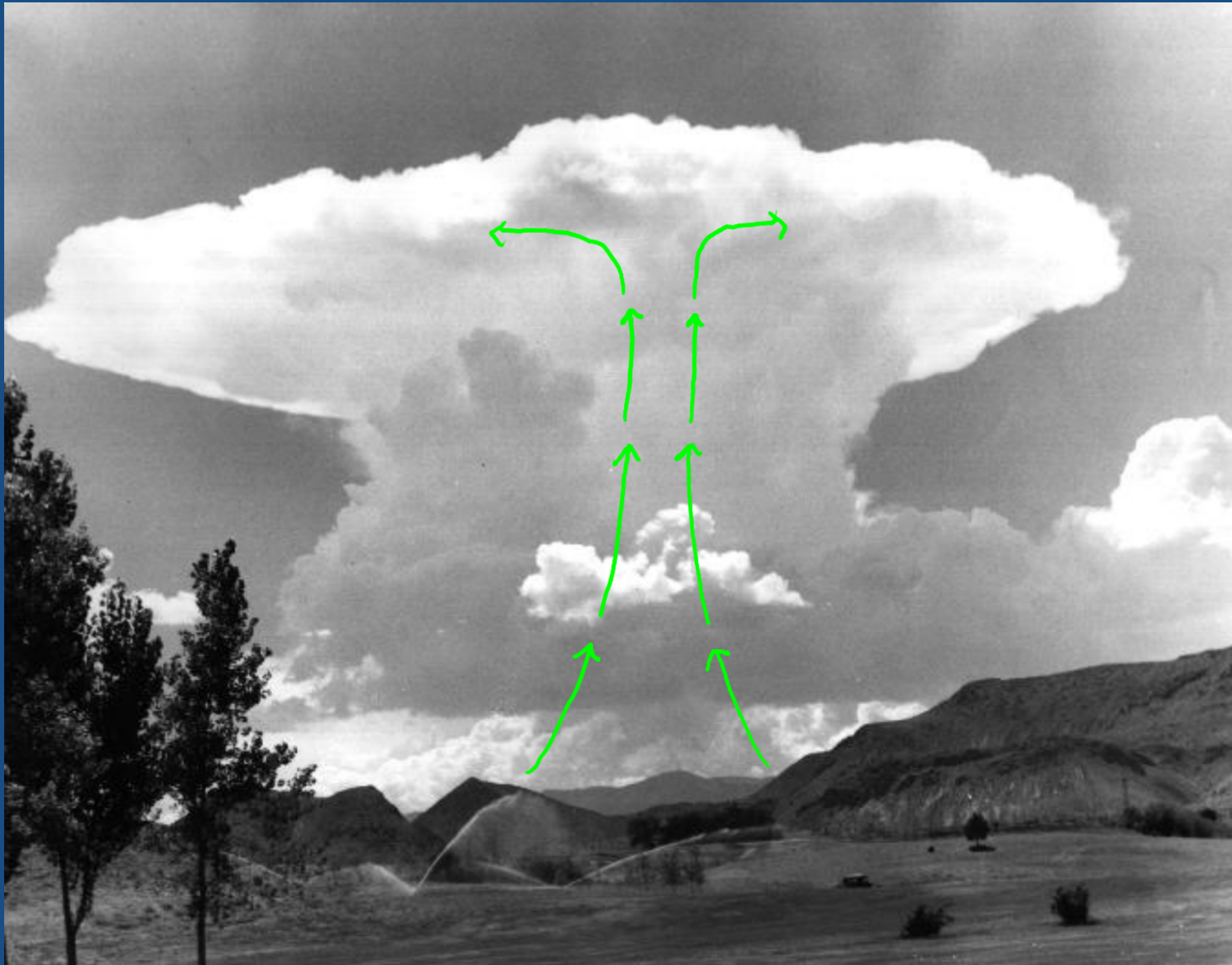
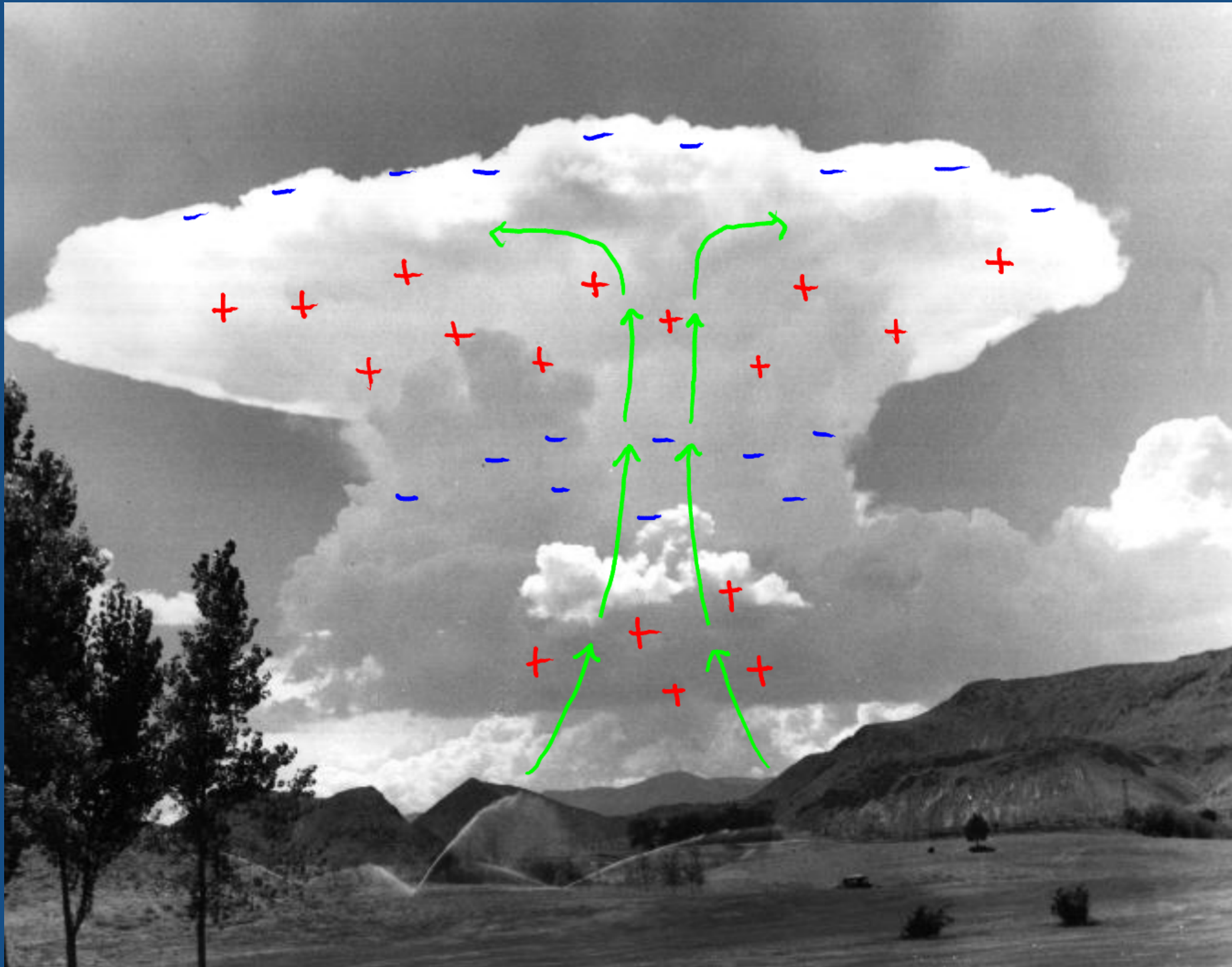


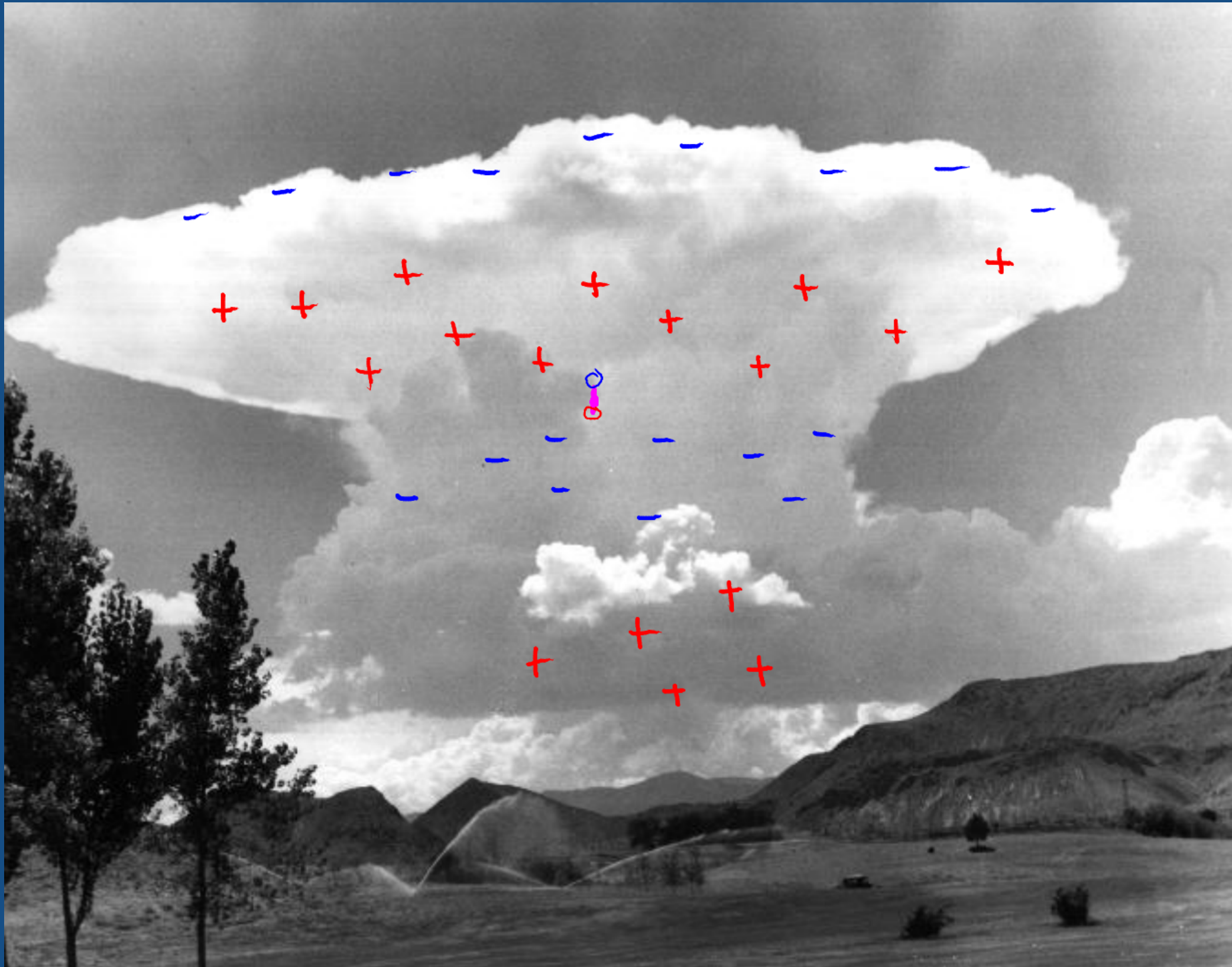
Lightning Interferometry

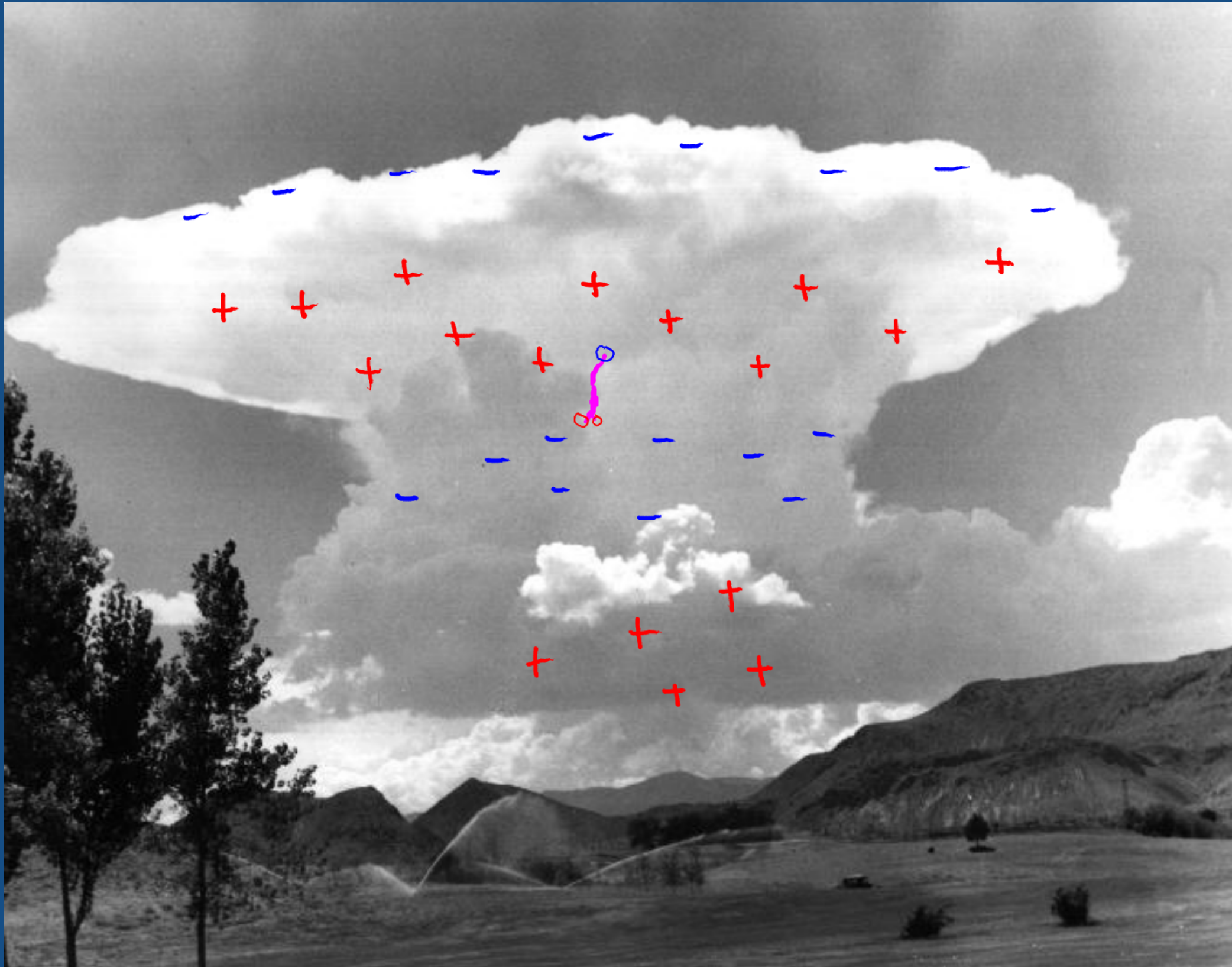
Michael Stock

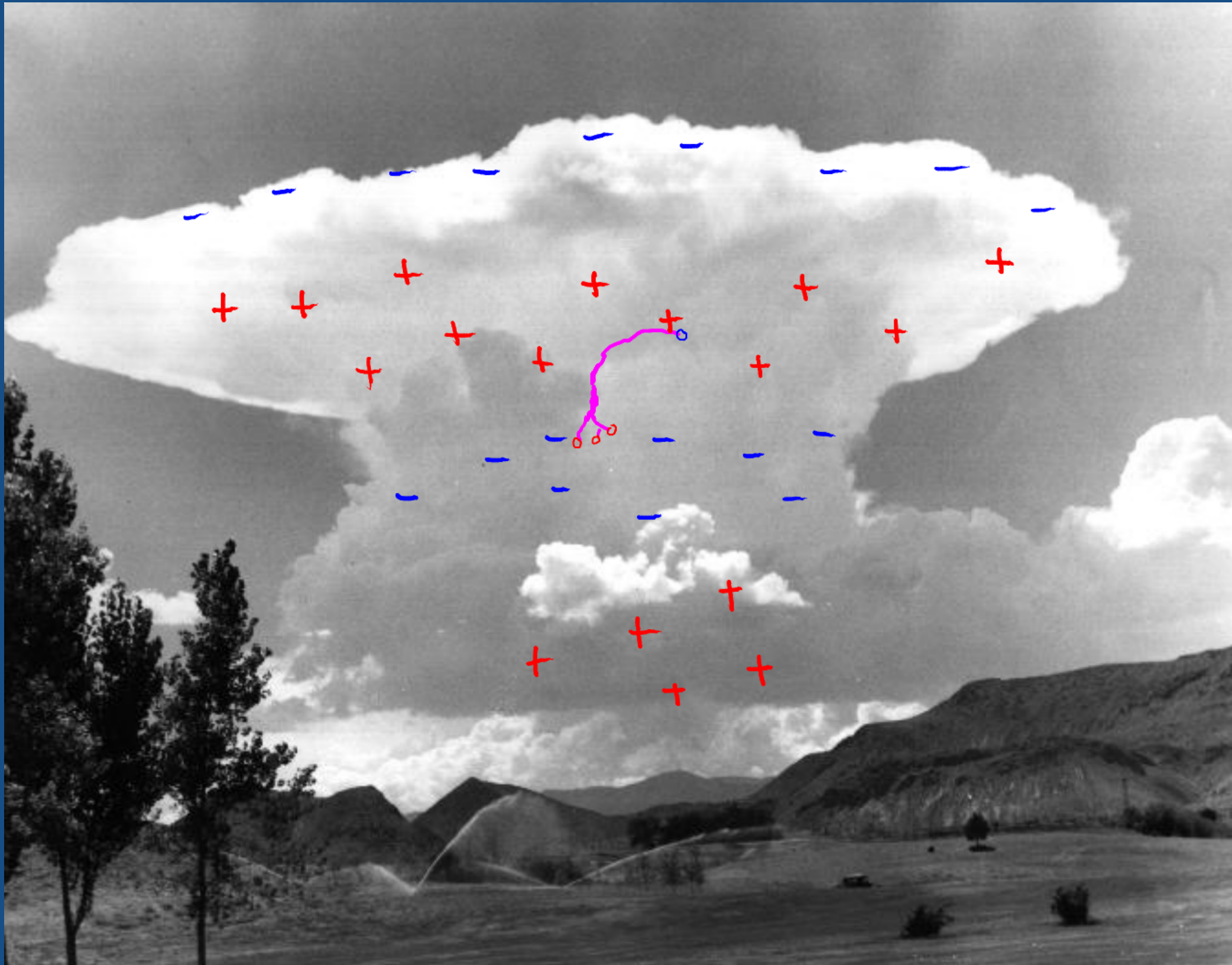


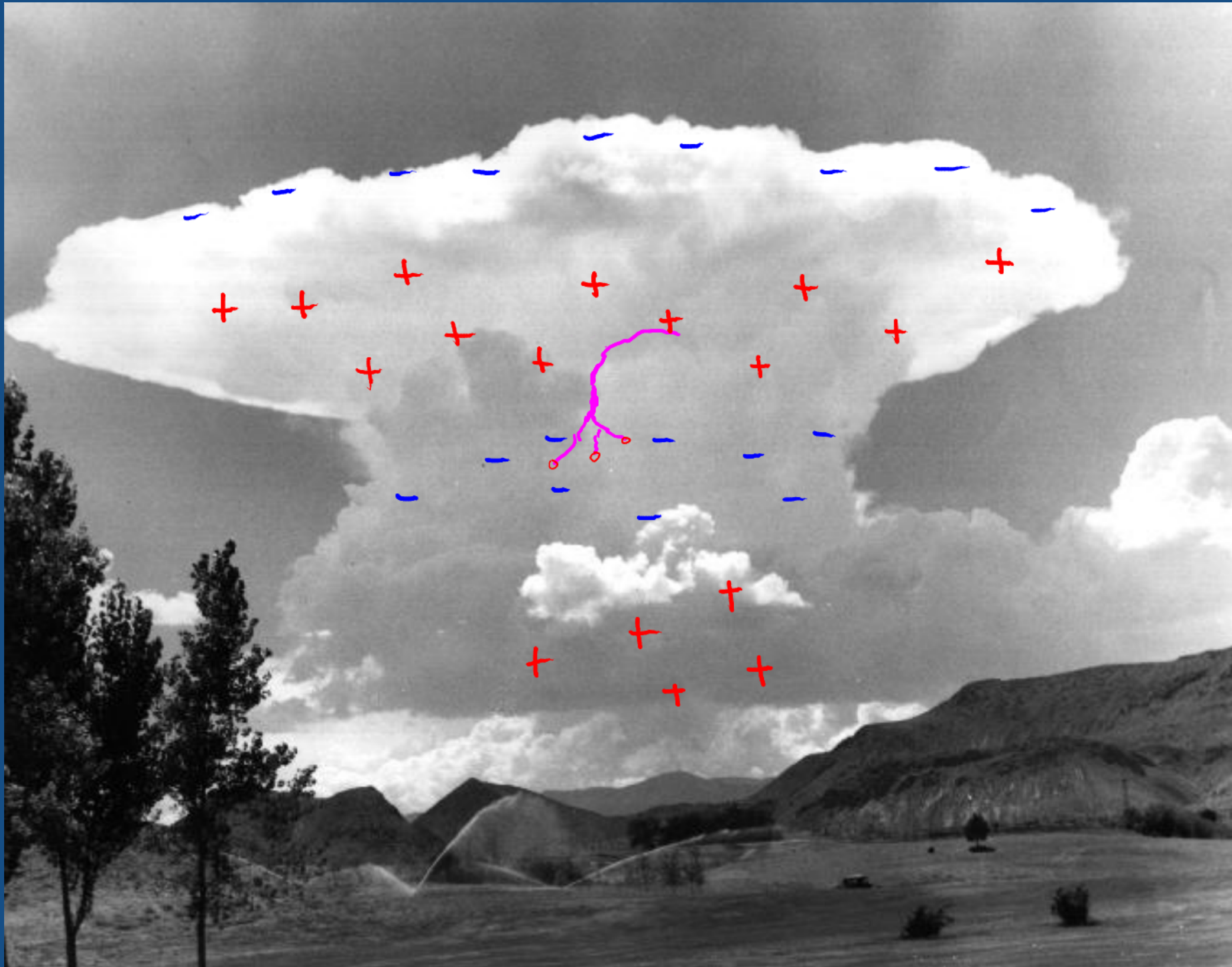


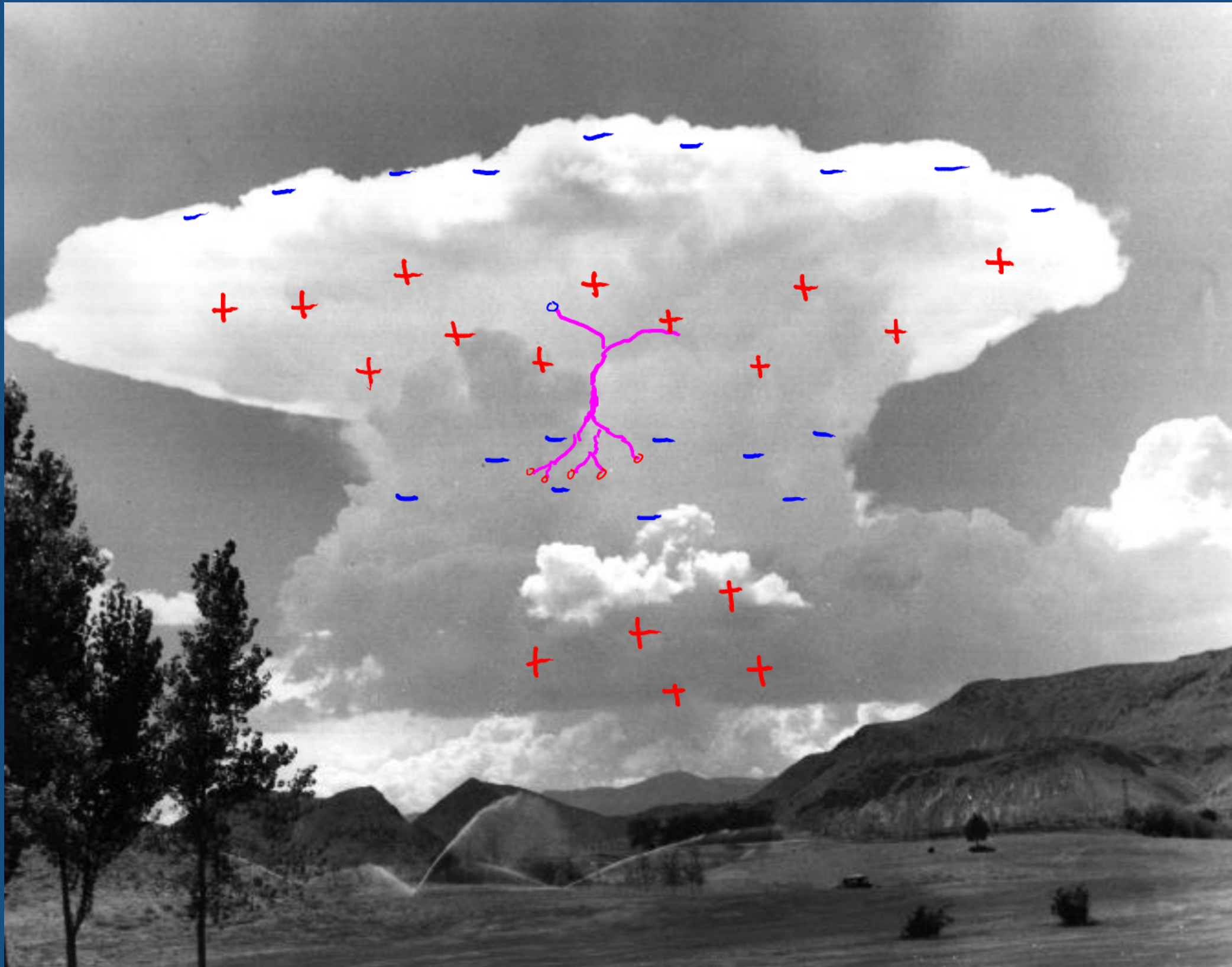


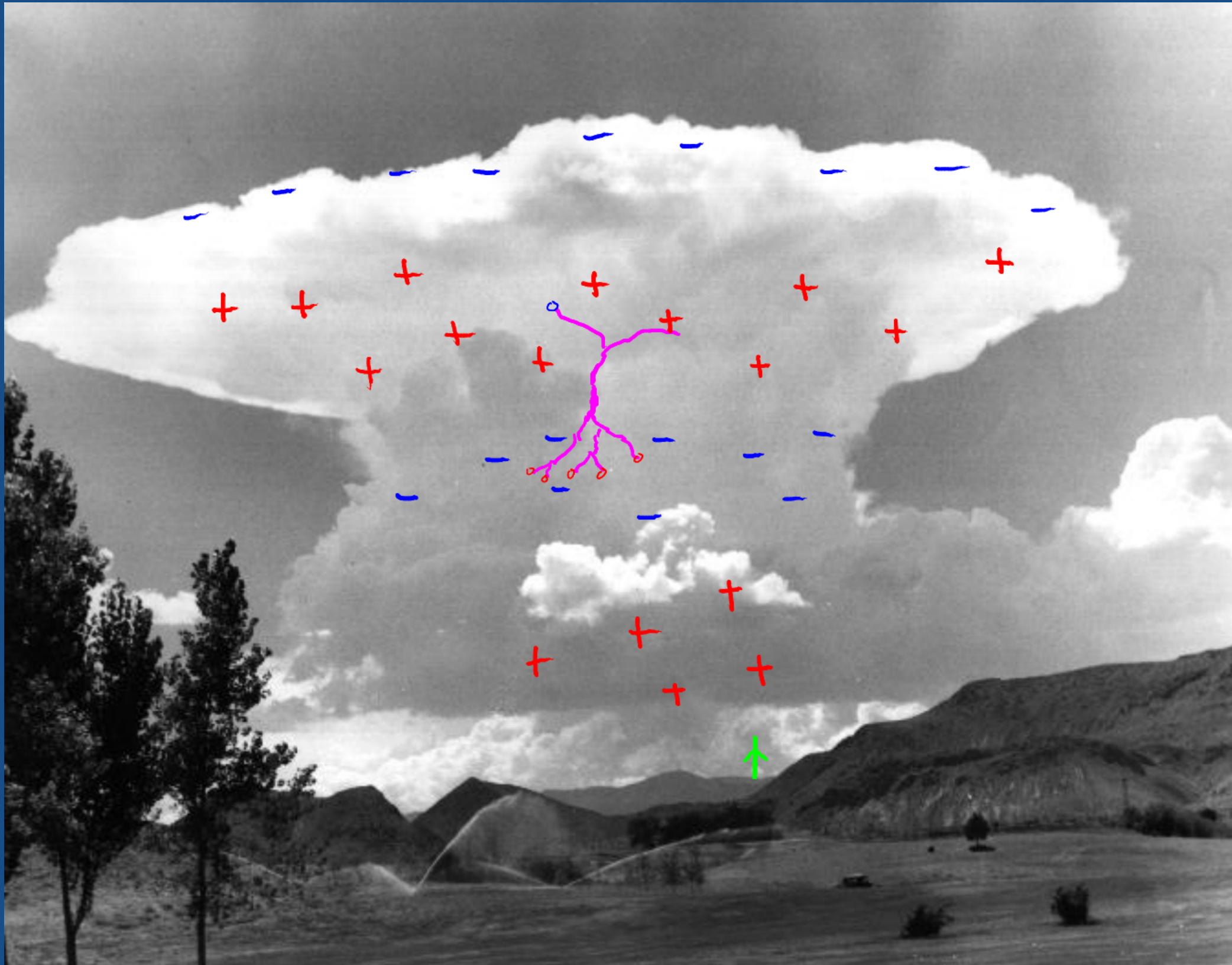


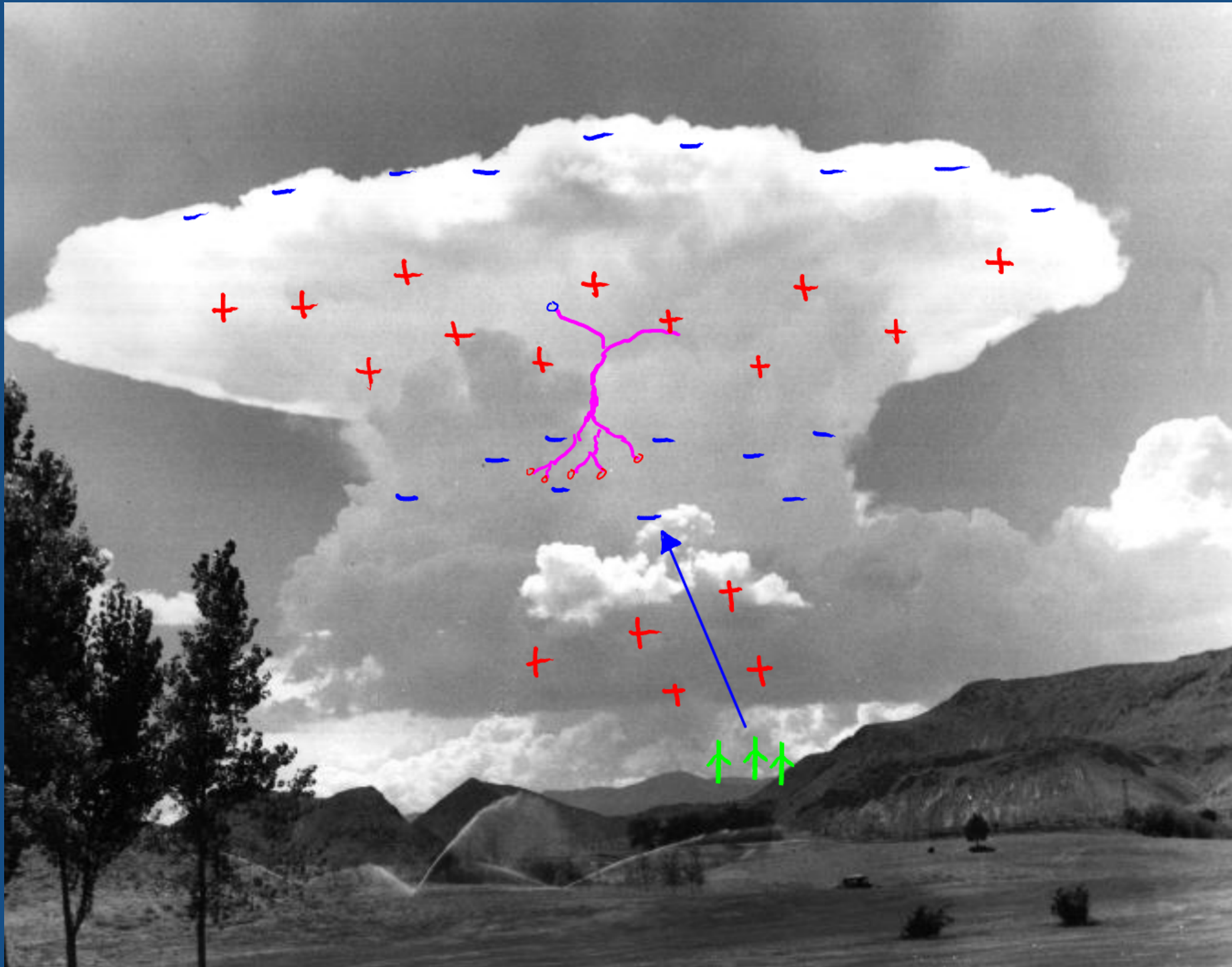






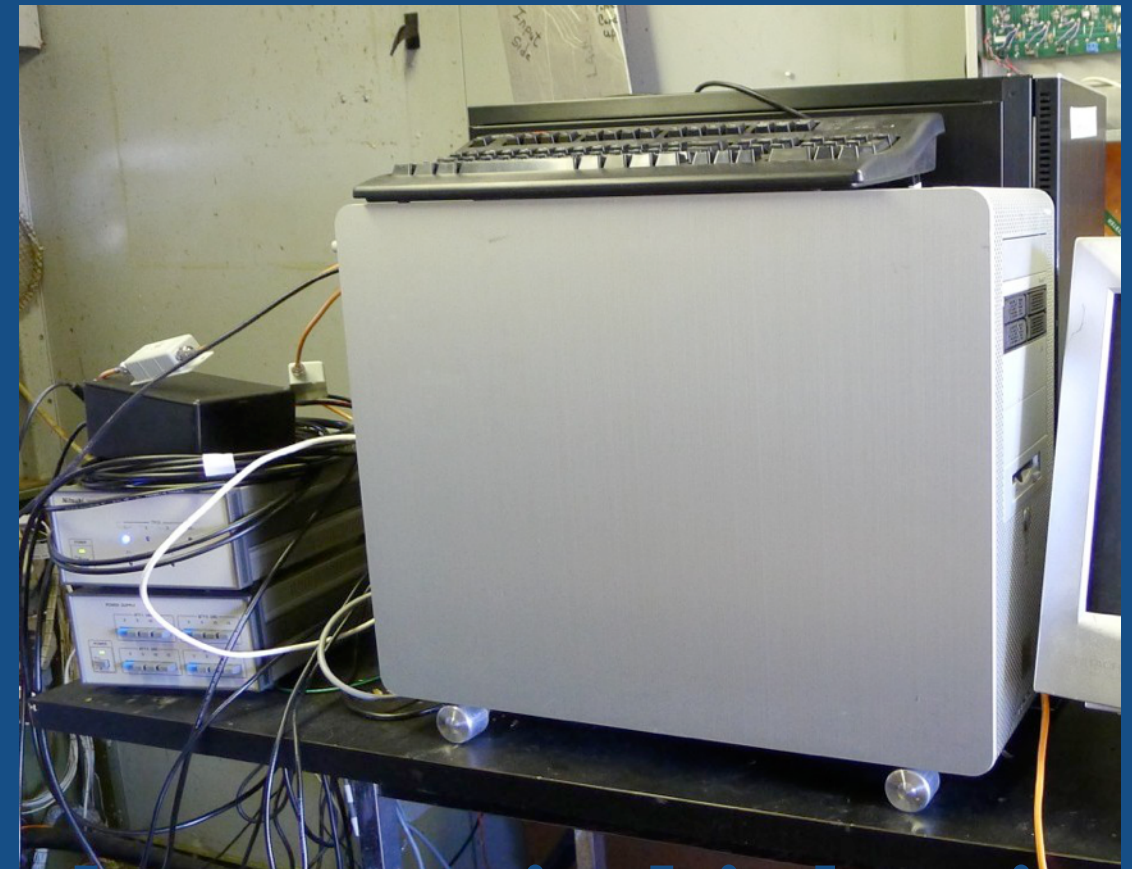
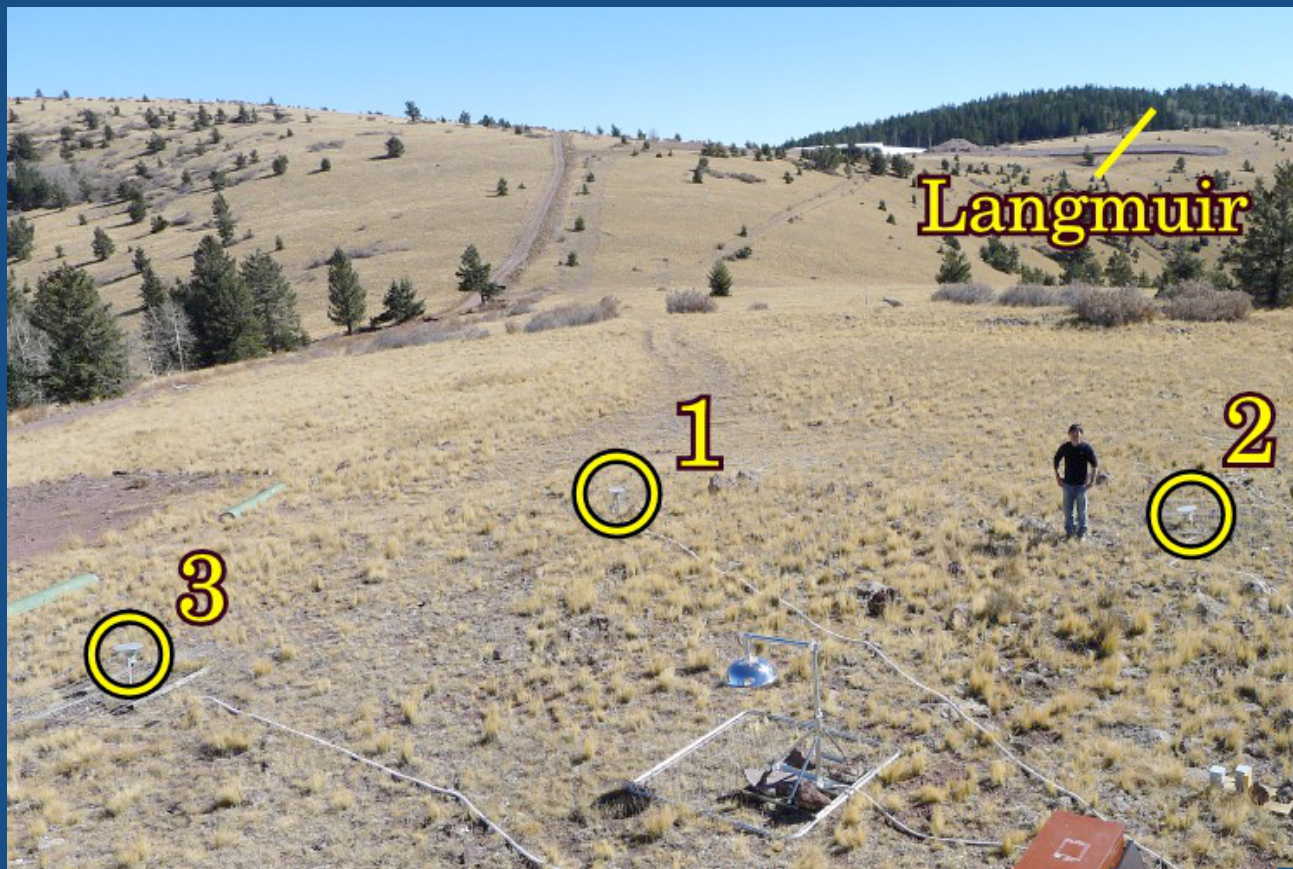








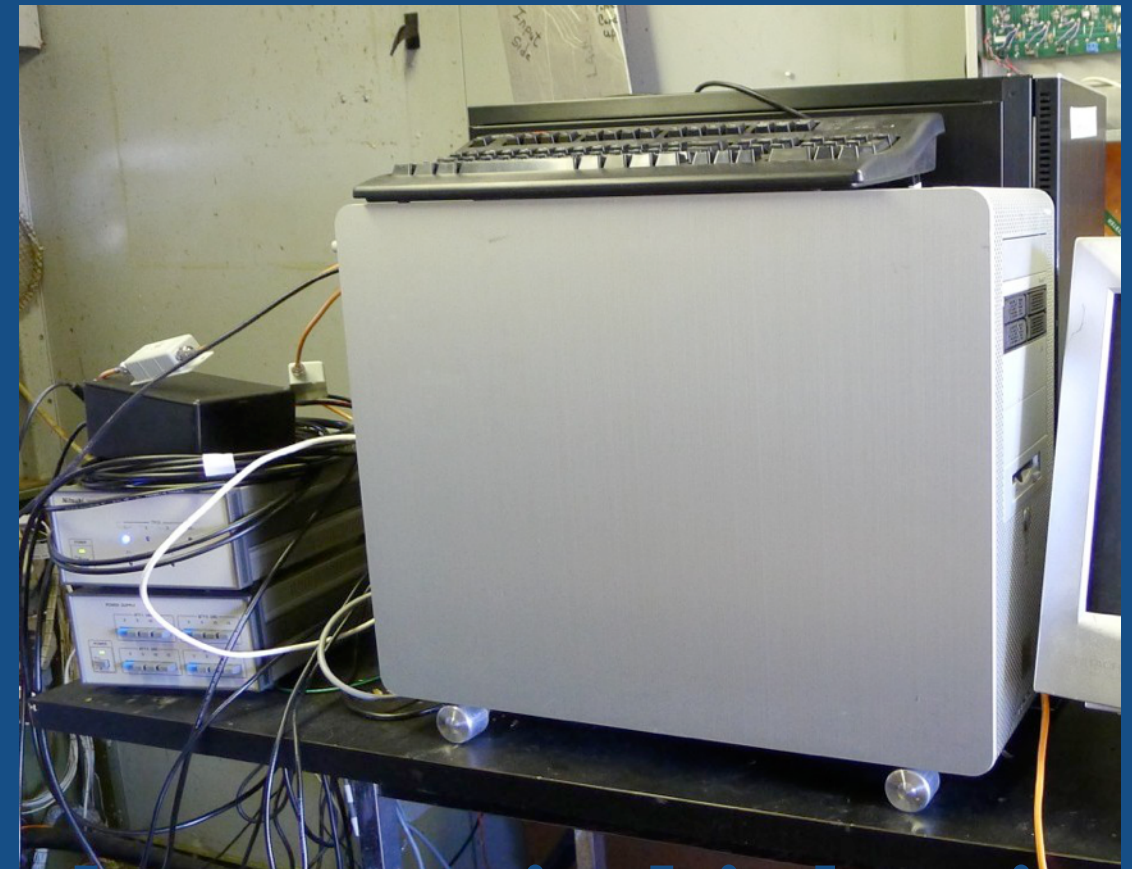
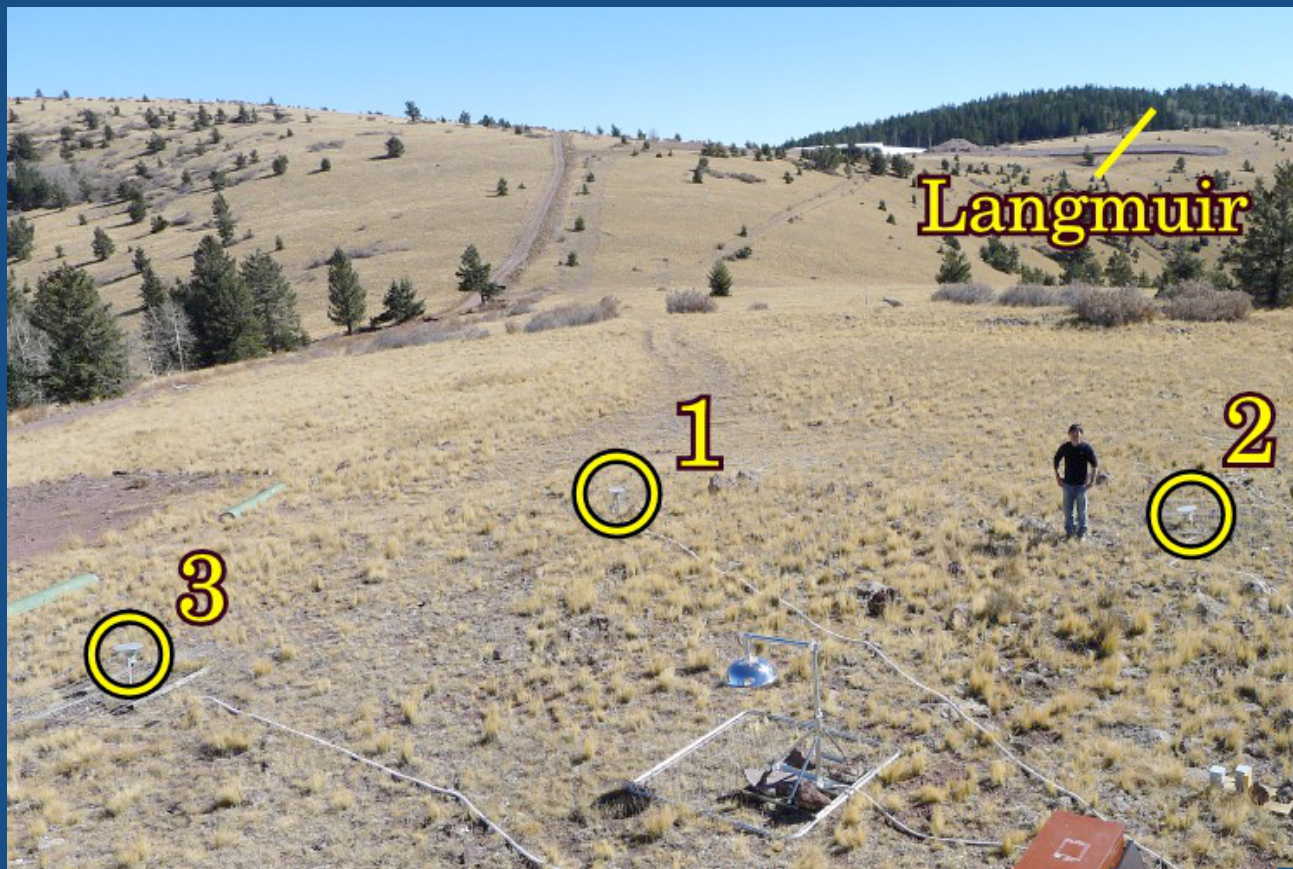
- 4 Antennas, 15 m baselines
- 20-80 MHz band
- Continuous Recording
- < 1 micro-second timing resolution
- ~ 1 degree angular uncertainty
- 20 km range



The Langmuir Lightning Interferometer



- 4 Antennas, 15 m baselines
- 20-80 MHz band
- Continuous Recording
- < 1 micro-second timing resolution
- ~ 1 degree angular uncertainty
- 20 km range



The Langmuir Lightning Interferometer

	LWA	LLI
Total Bandwidth	10-90 MHz	20-80 MHz
Channel Bandwidth	100 kHz	60 MHz
Time Resolution	160 us	0.3 us
Antennas	256	4
Aperture	100 m	15 m
Angular Resolution	~1 deg	~20 deg
Angular Uncertainty	??	~1 deg

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Photograph by Kara Swanson



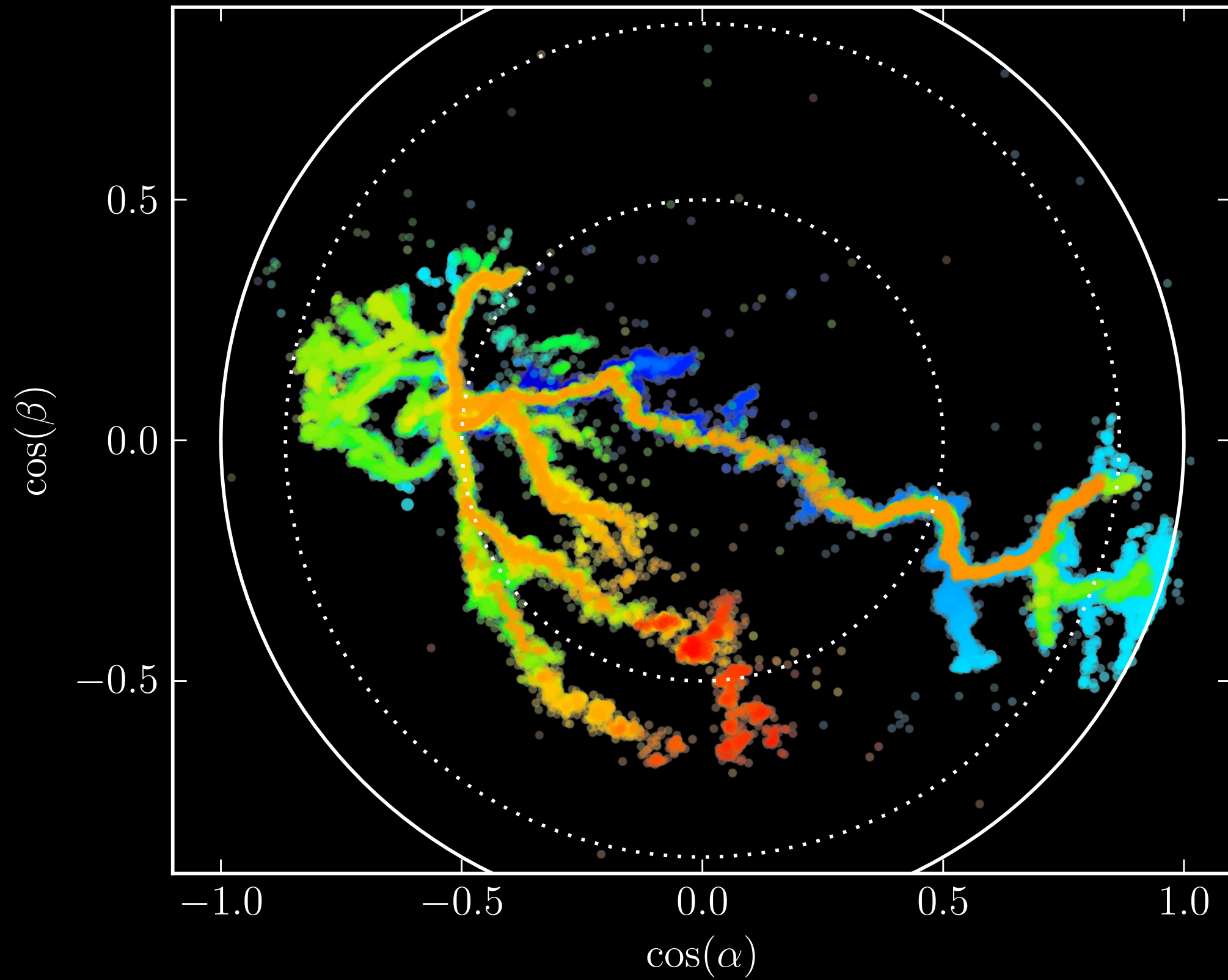
A Bolt From the Blue

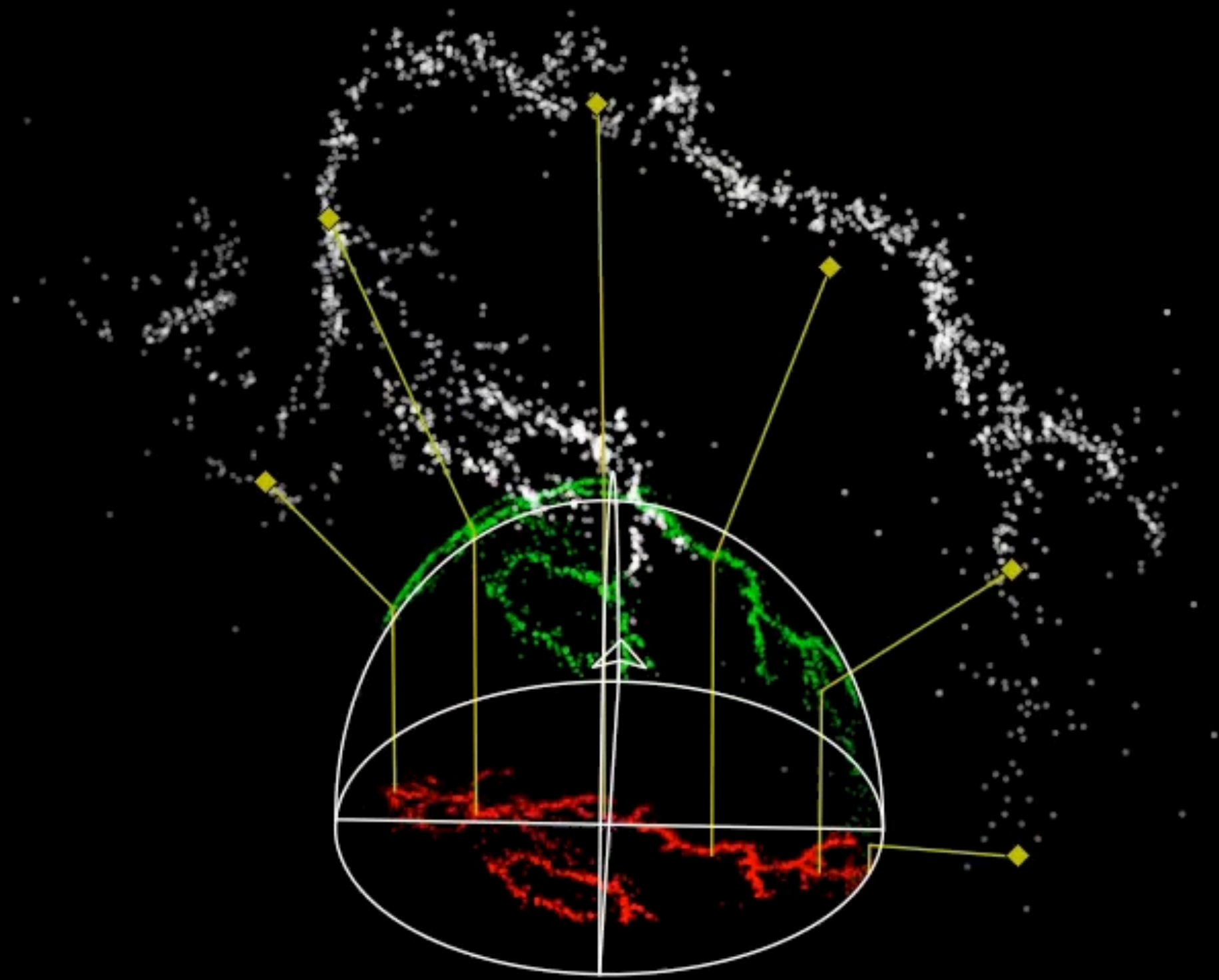


Photograph by Kara Swanson

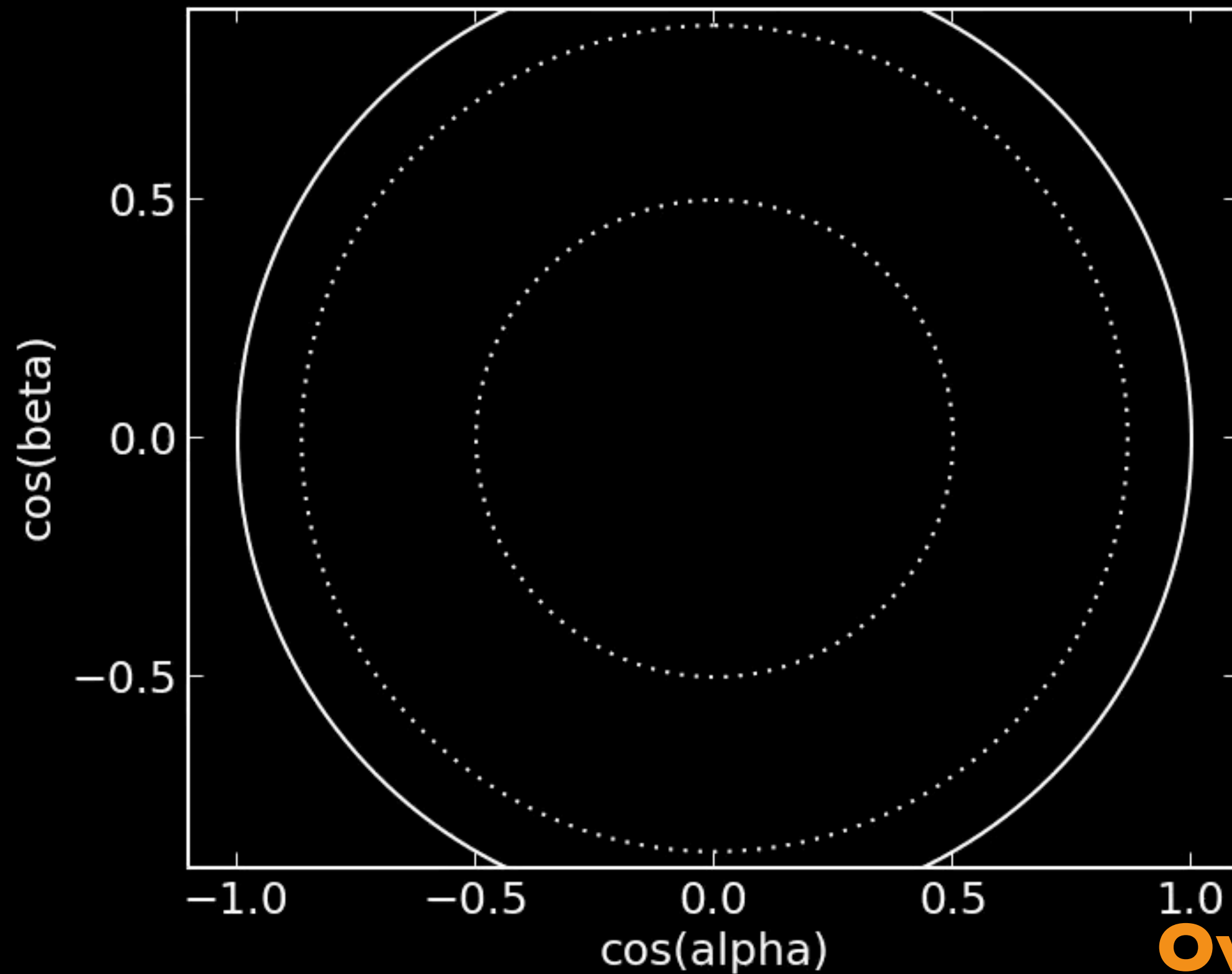


A Bolt From the Blue



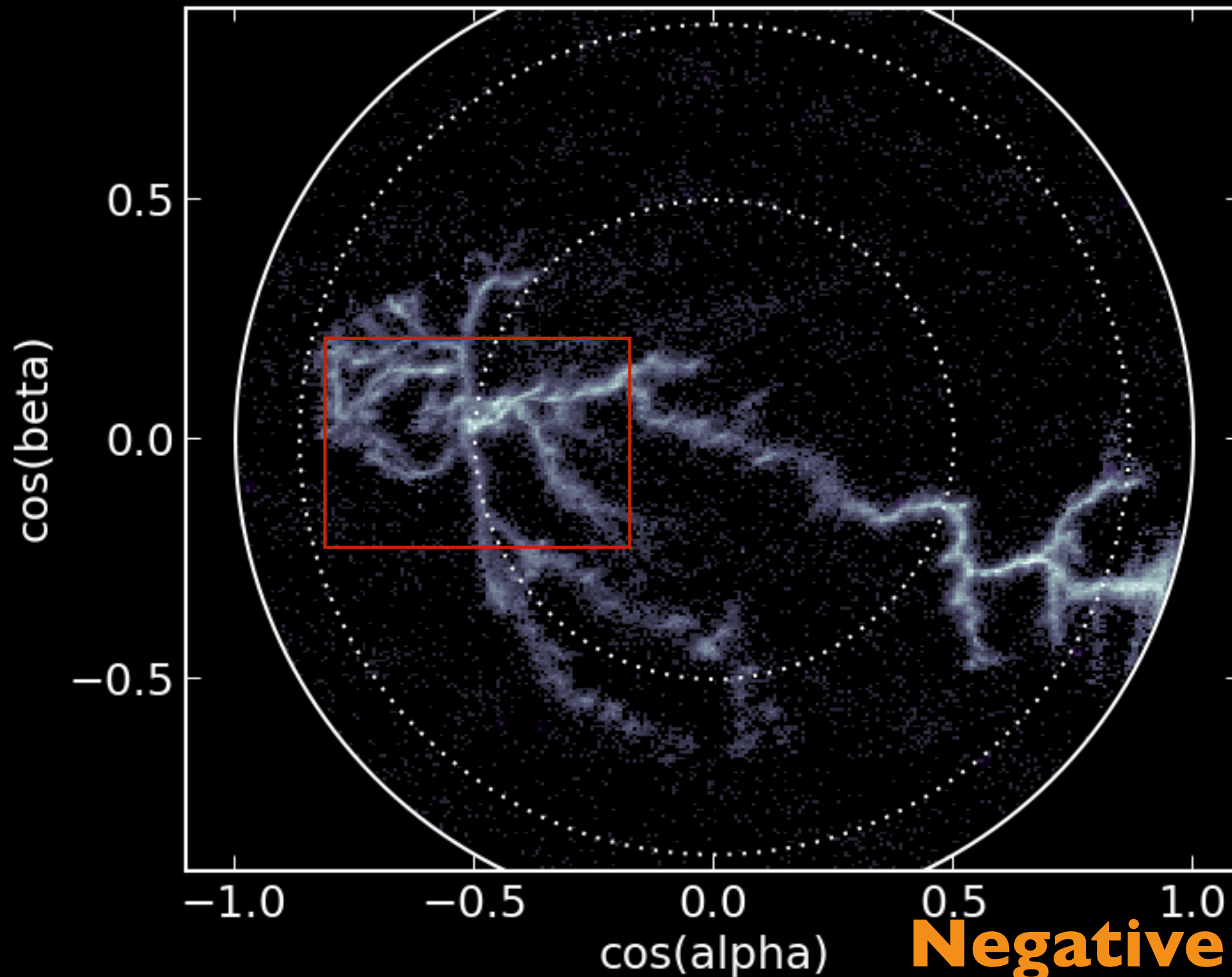


Flash at 2013/07/08 20:09:01.143378 UT
Frame Rate: 6250 fps
43.300



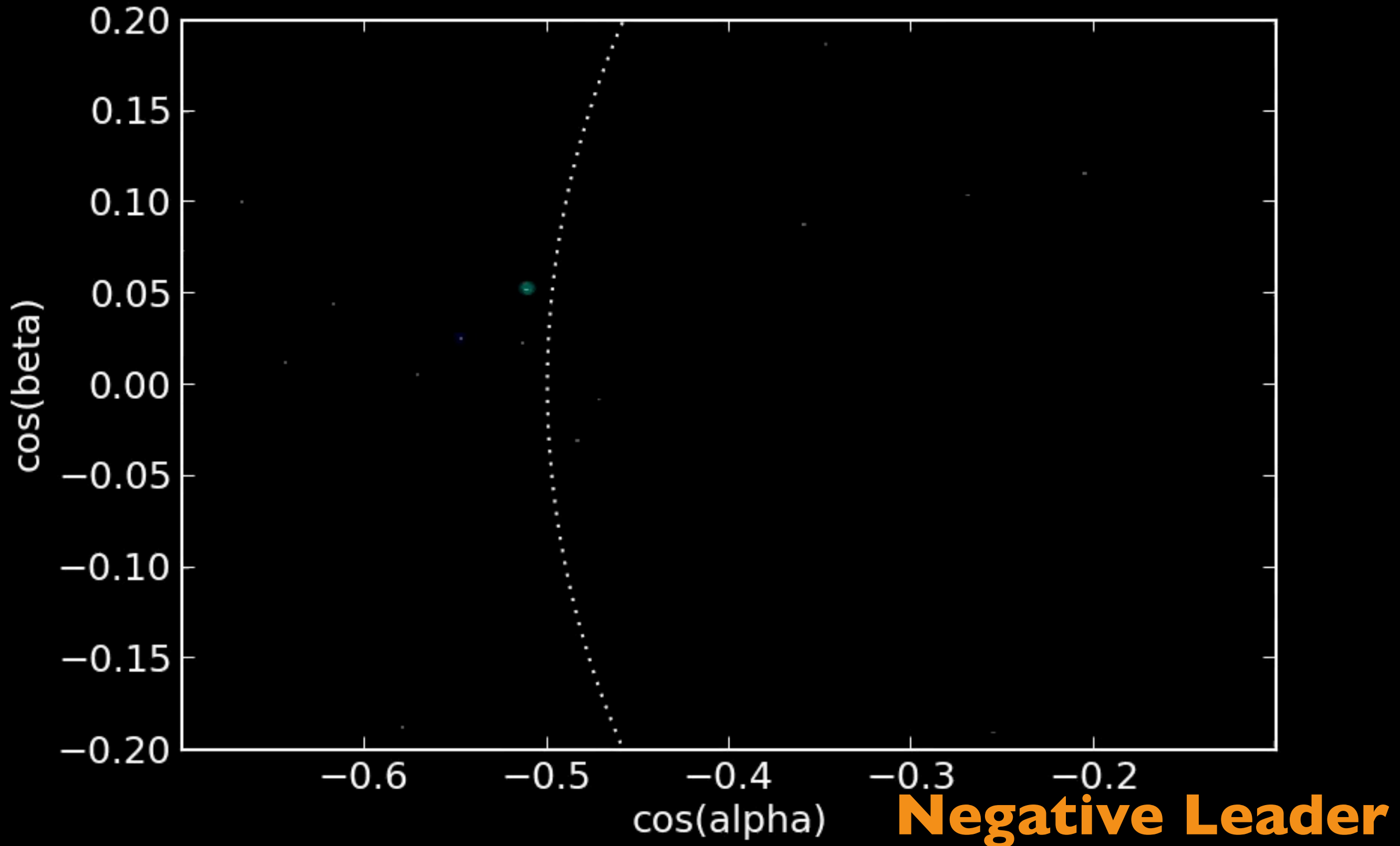
Overview

Flash at 2013/07/08 20:09:01.143378 UT
Frame Rate: 4000 fps
406.800

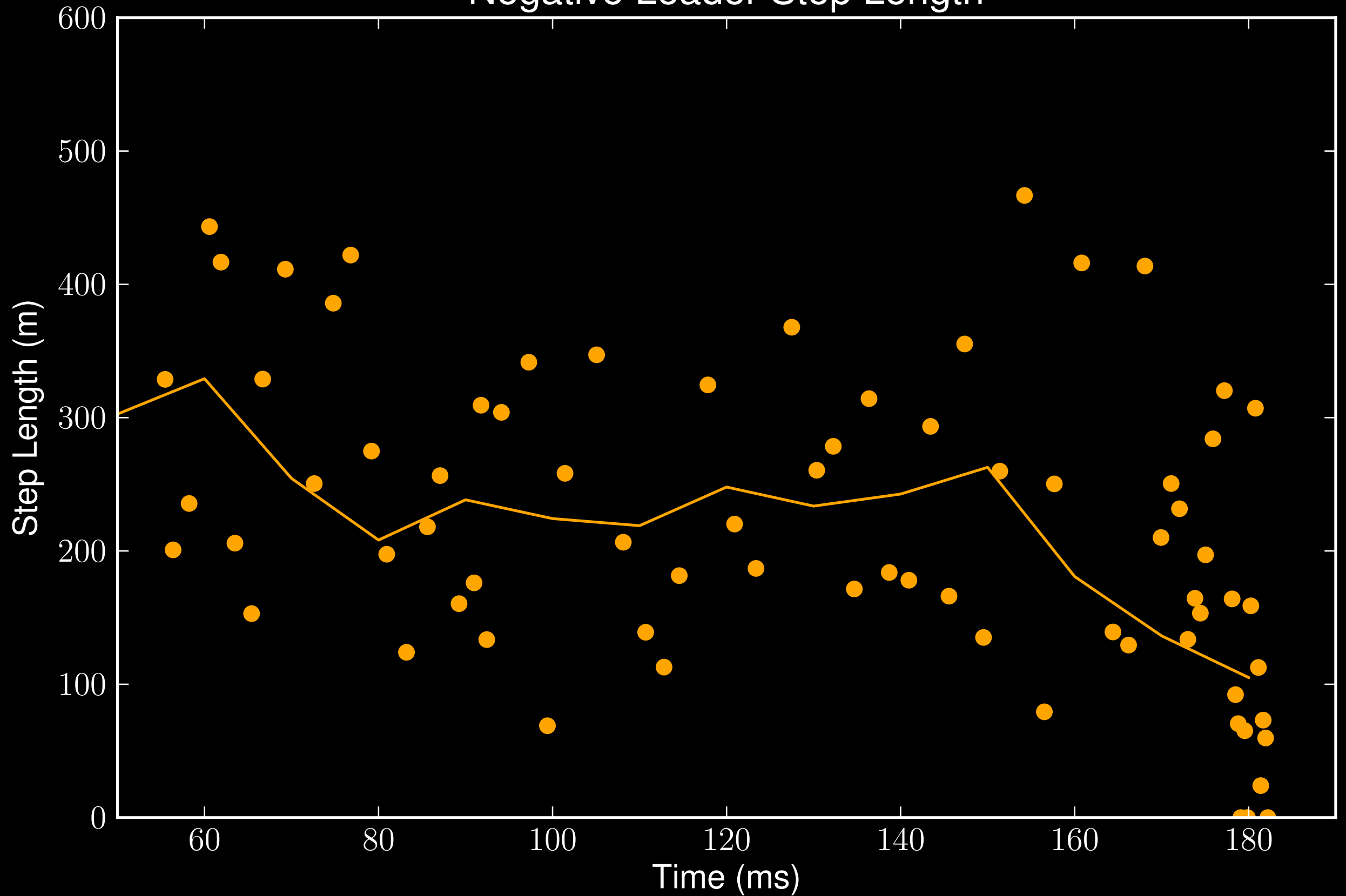


Negative Leader

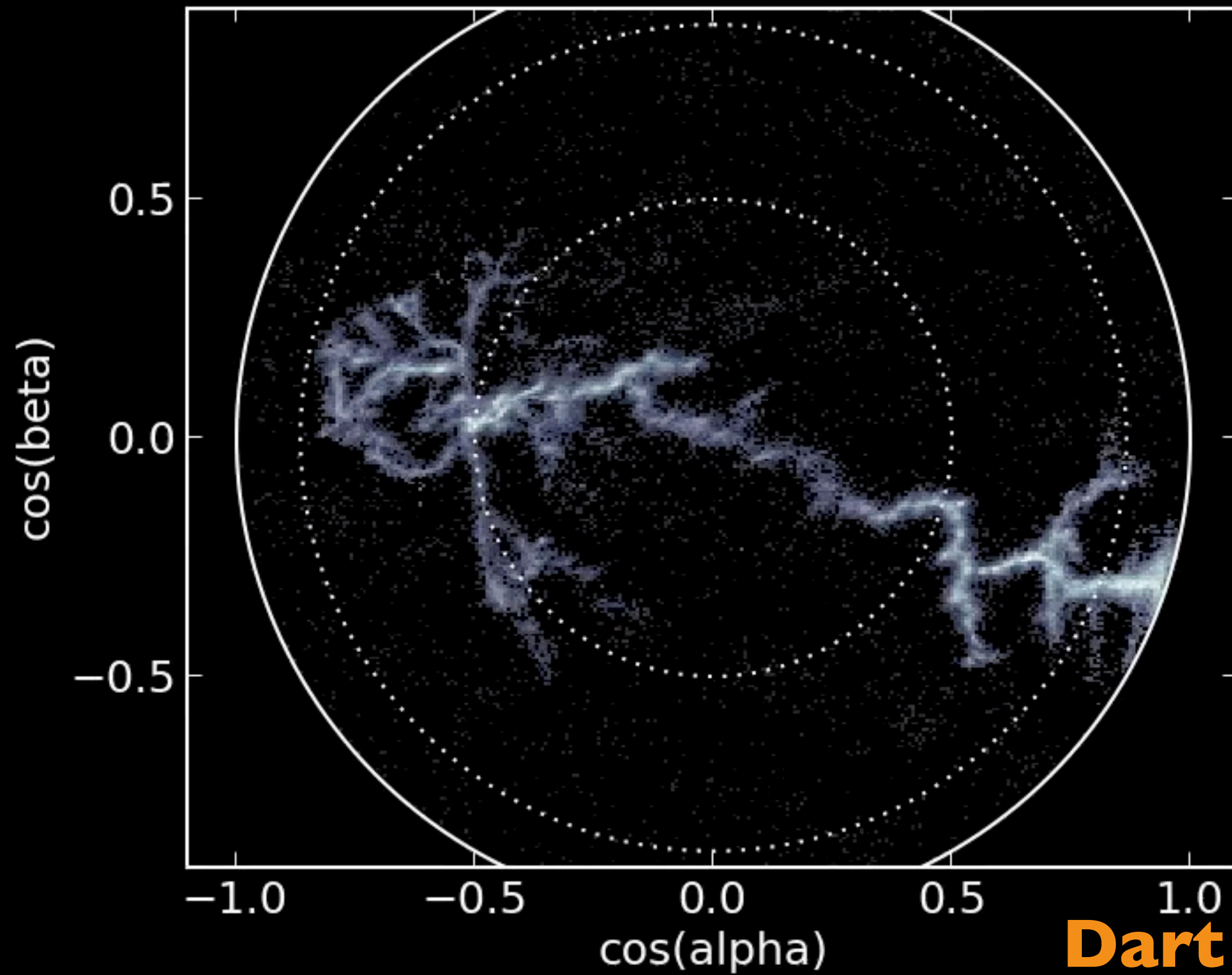
Flash at 2013/07/08 20:09:01.143378 UT
Frame Rate: 40000 fps
54.000



Negative Leader Step Length



Flash at 2013/07/08 20:09:01.143378 UT
Frame Rate: 200000 fps
262.400



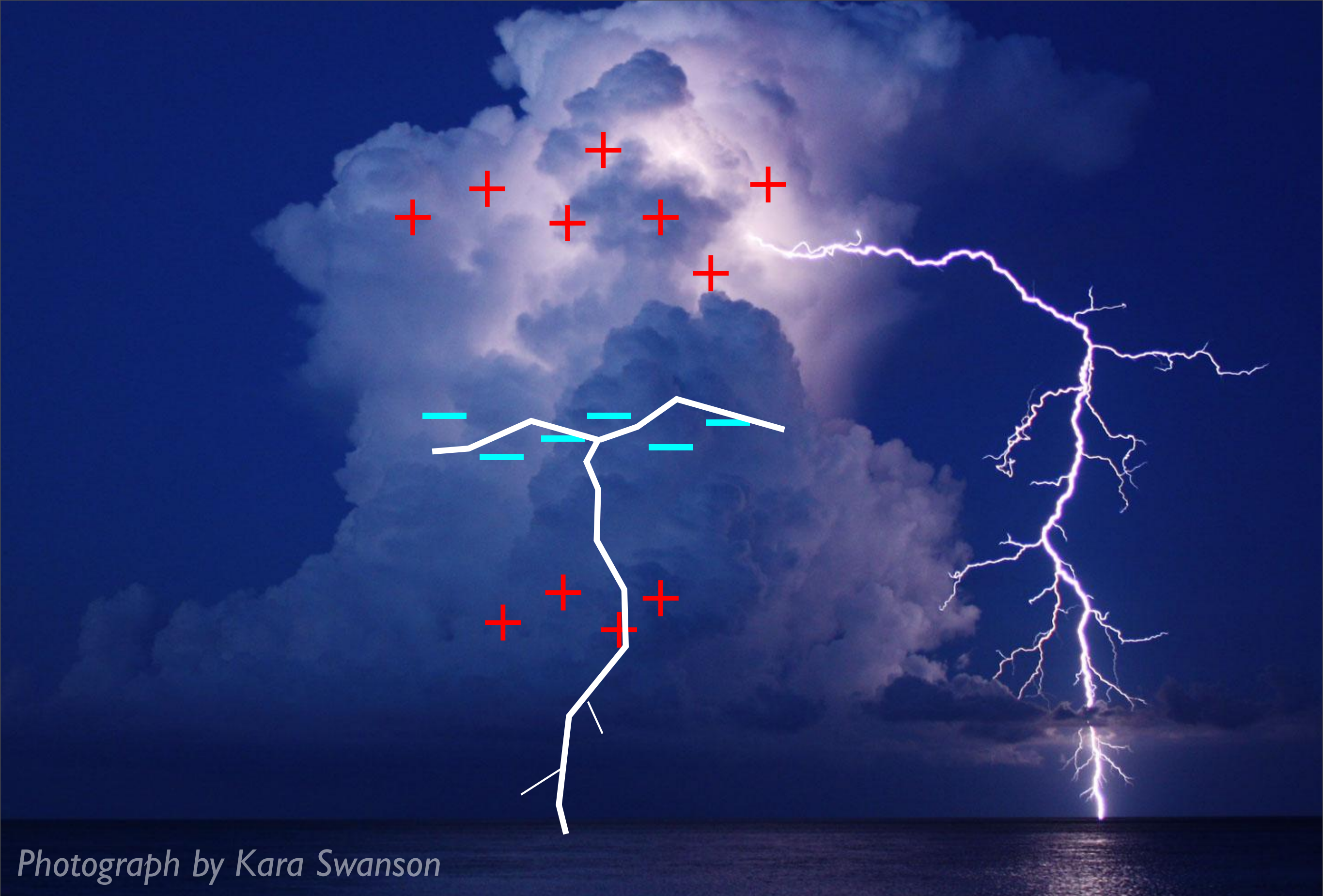
Dart Leader



Photograph by Kara Swanson



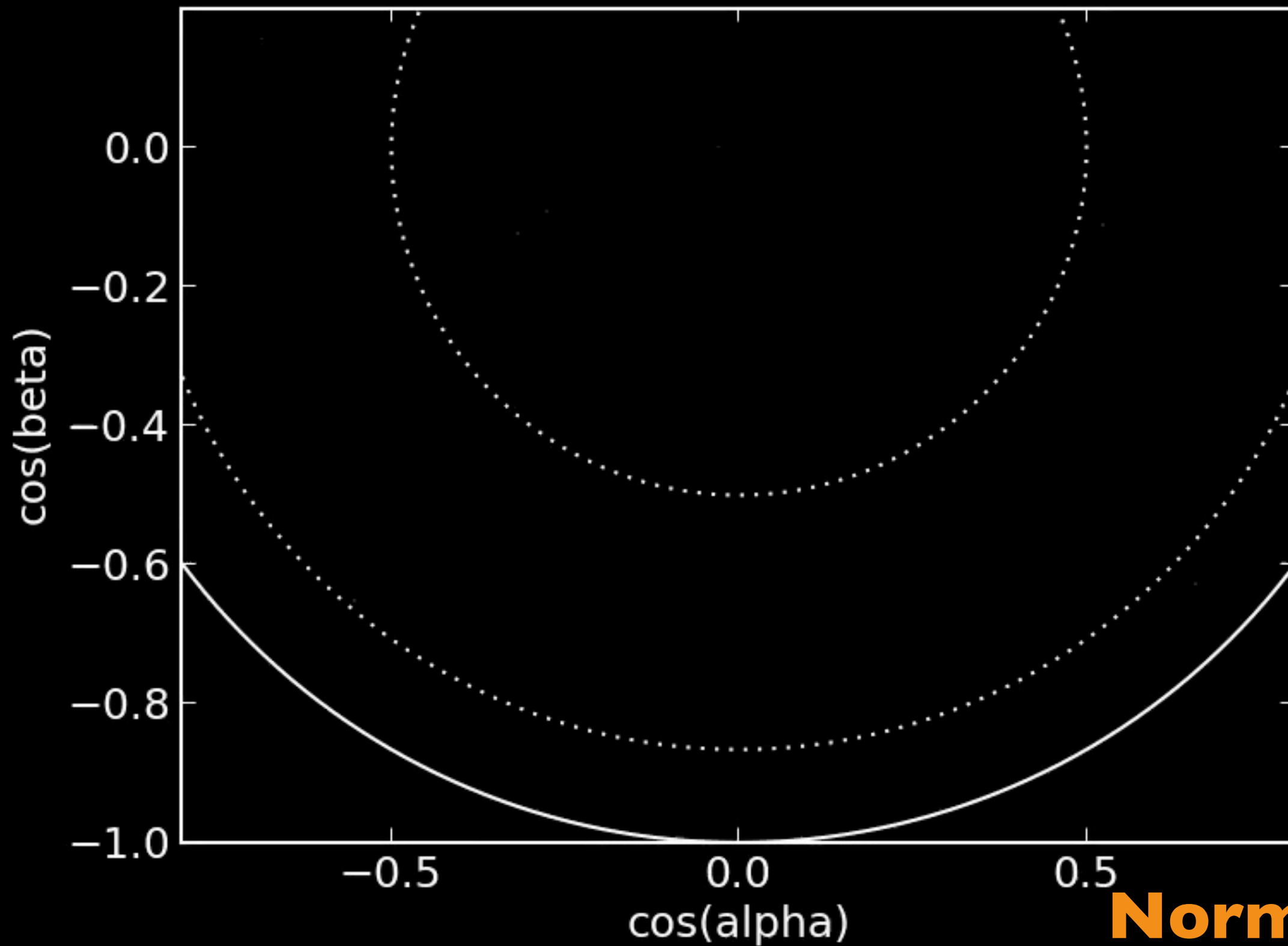
A Bolt From the Blue



Photograph by Kara Swanson

A Bolt From the Blue

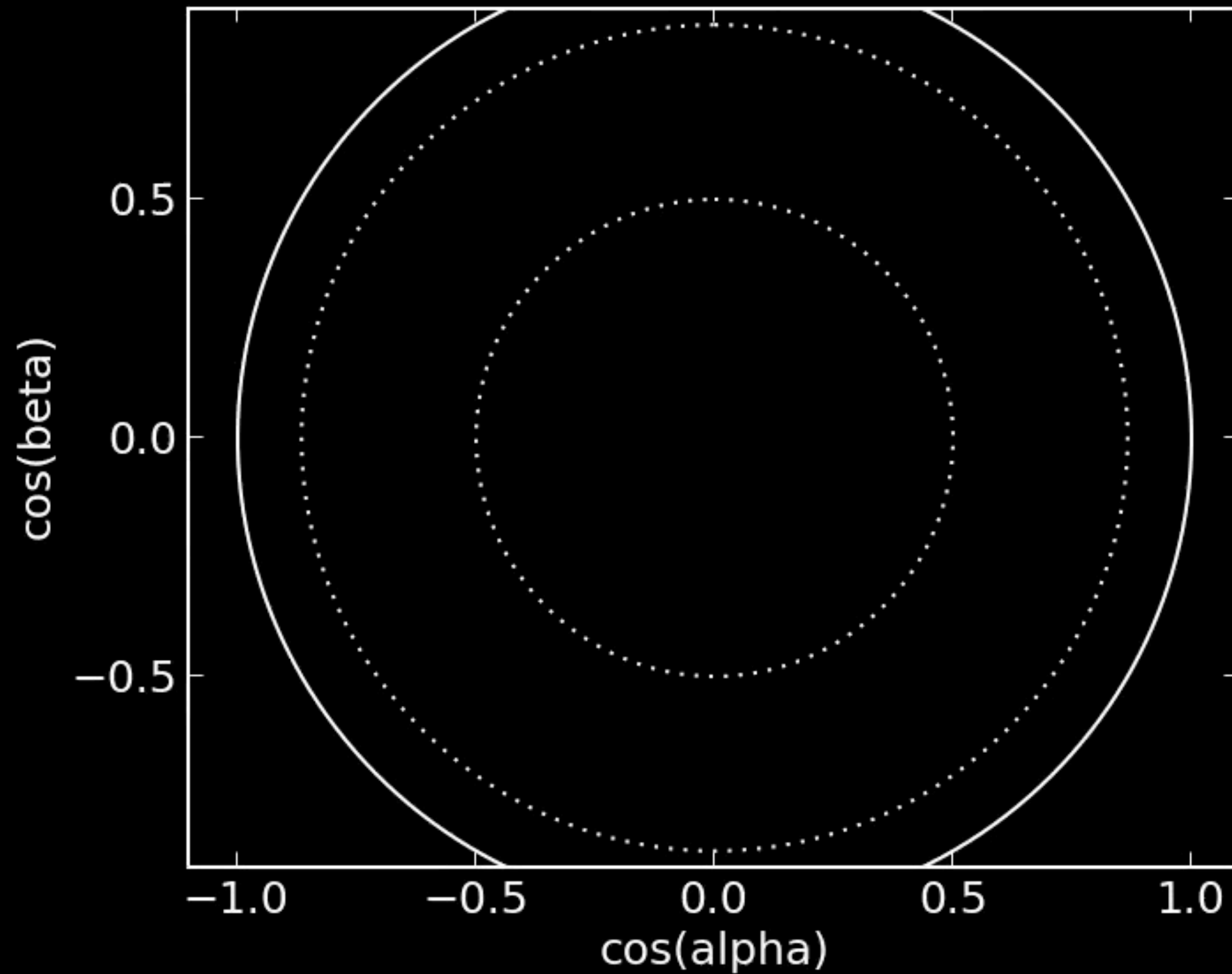
Flash at 2013/07/24 21:39:00.292110 UT
Frame Rate: 6250 fps
490.000



Normal CG

End

Flash at 2013/07/08 20:09:01.143378 UT
Frame Rate: 6250 fps
43.300



BFB