

# Small Scale EUV Brightenings

Kenza Arraki  
698 Solar Image Processing

SDO/AIA- 211 20120501\_045702

SDO/AIA- 193 20120501\_045656

SDO/AIA- 171 20120501\_045649

[aia.lmsal.com](http://aia.lmsal.com)



# Scientific Motivation

- Correlations:
  - Spatial distribution
  - Magnetic fields
  - Solar cycle
- Physical Processes:
  - Reconnection
  - Coronal heating

# DATA

- Single day of SDO AIA data
- Six filters
  - 94 Å, flaring region,  $\log(T) = 6.8$
  - 171 Å, quiet corona, transition region,  $\log(T) = 5.8$
  - 193 Å, corona,  $\log(T) = 6.1, 7.3$
  - 211 Å, active region corona,  $\log(T) = 6.3$
  - 304 Å, chromosphere, transition region,  $\log(T) = 4.7$
  - 335 Å, active region corona,  $\log(T) = 6.4$

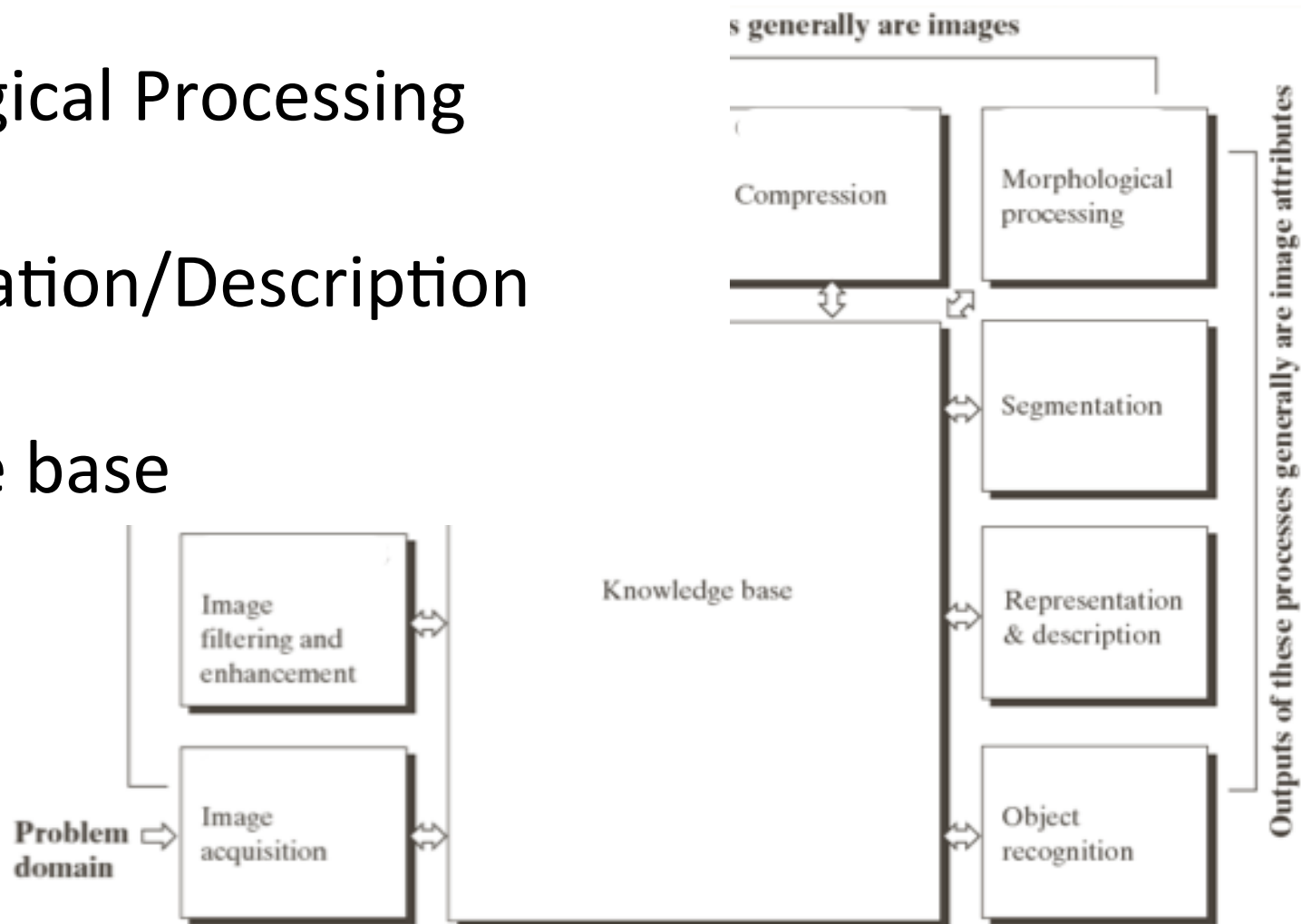
1. Image Acquisition

2. Image filtering and enhancement

3. Morphological Processing

4. Representation/Description

5. Knowledge base

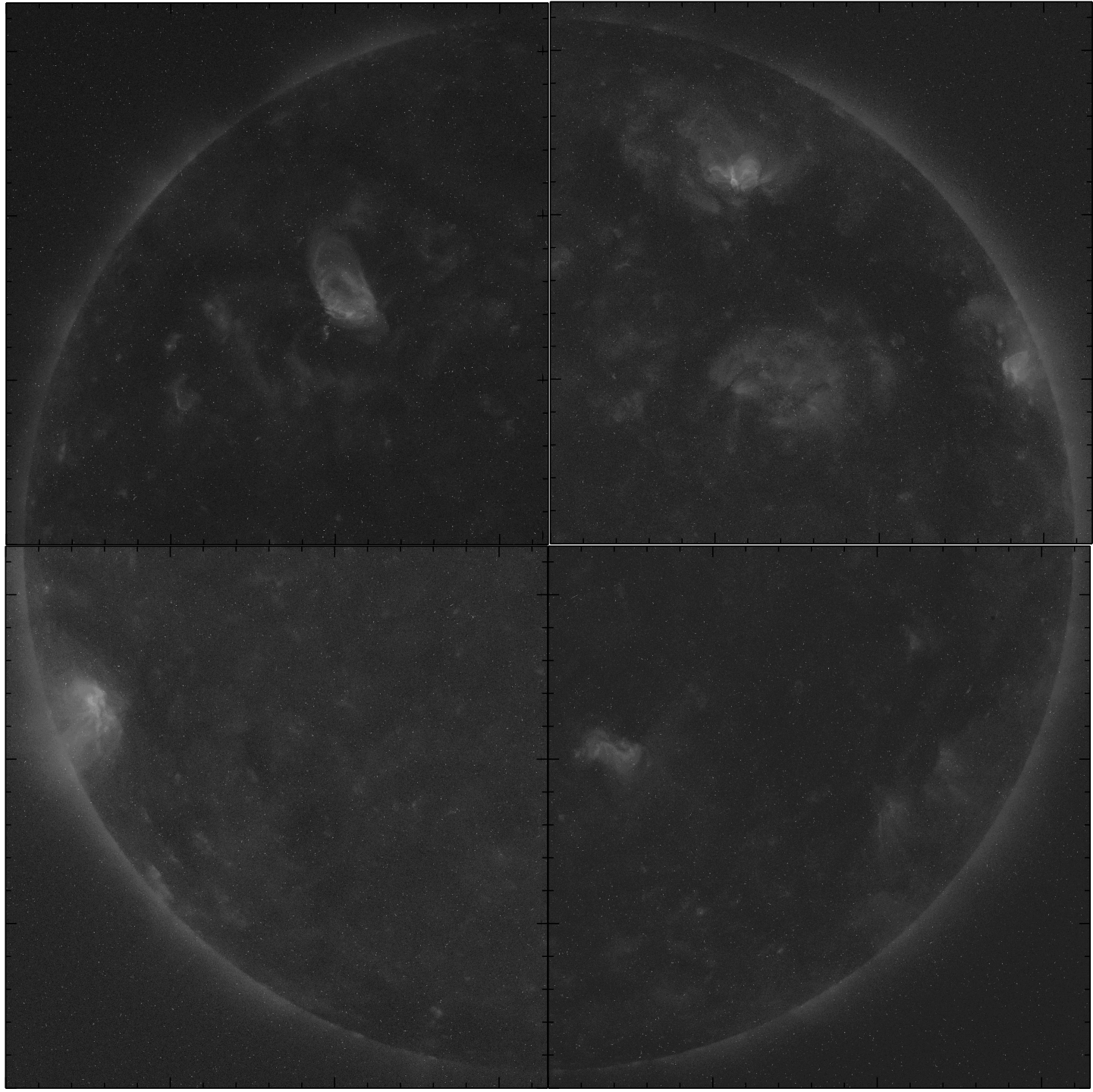




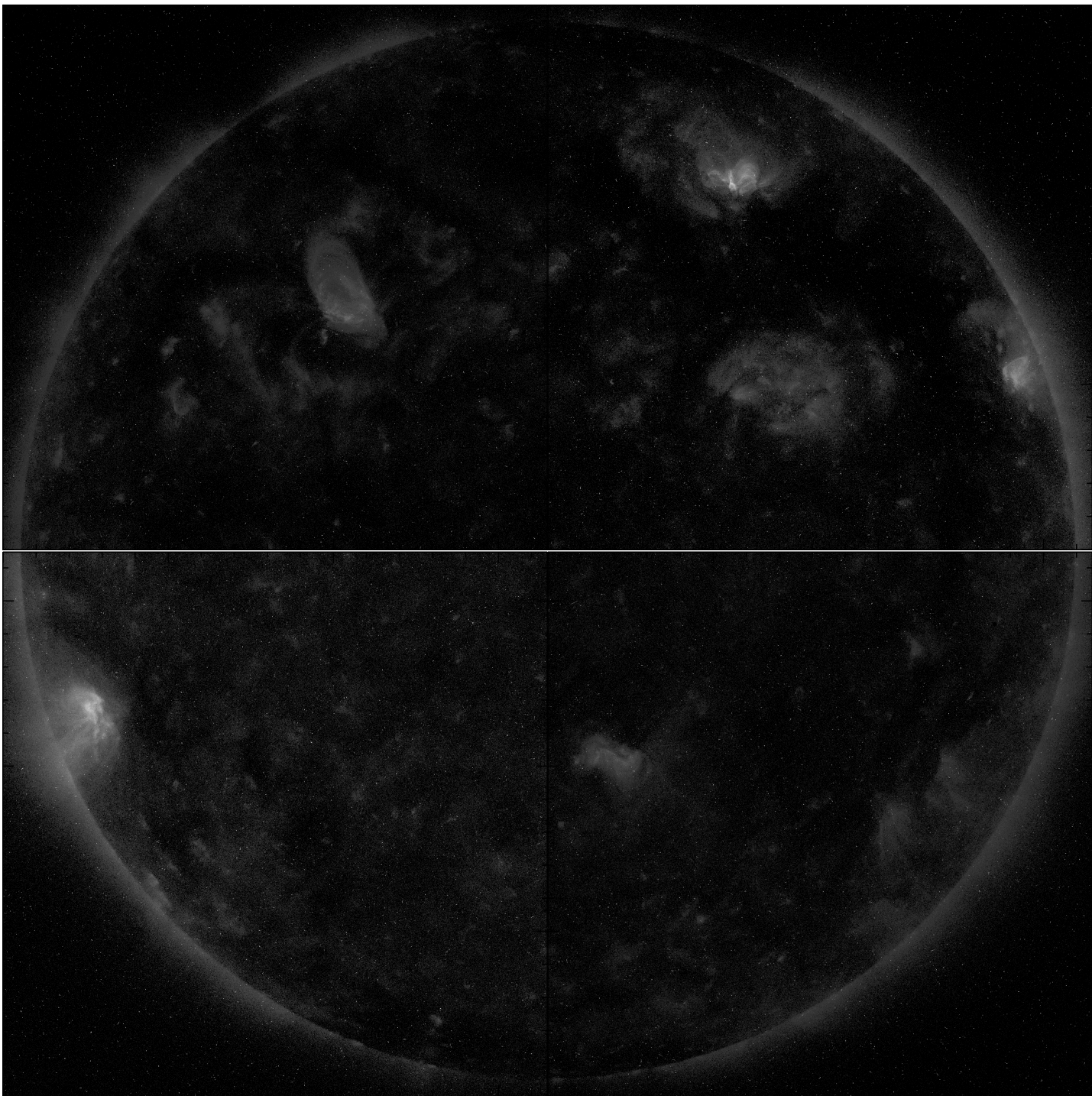
# Morphological Processing

- Dilate
- Erode
- Hit or Miss
- Contour

**94 Å - SDO AIA**



Threshold



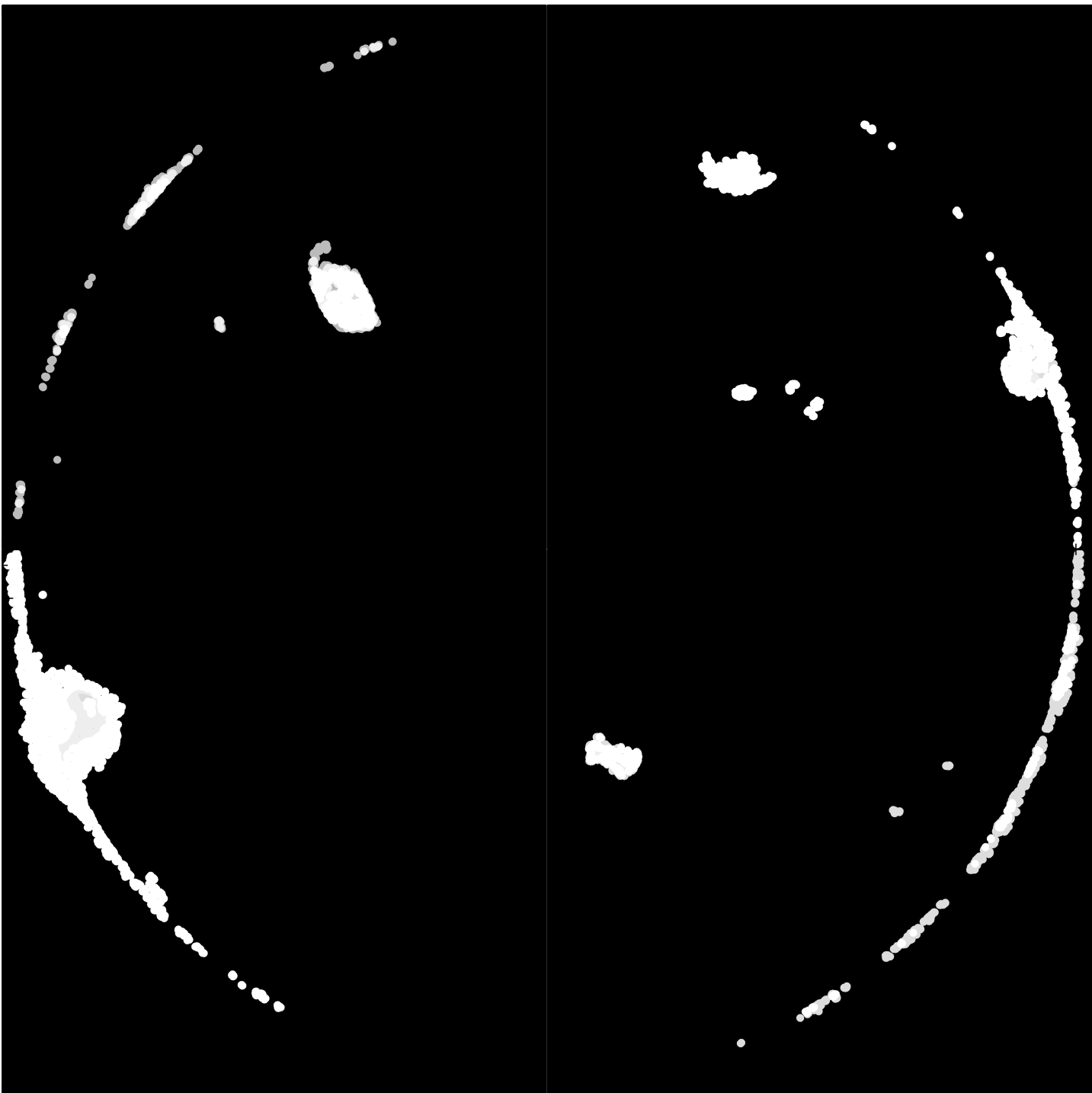
Threshold

Open

Erode

Dilate

94



Threshold

Open

Erode

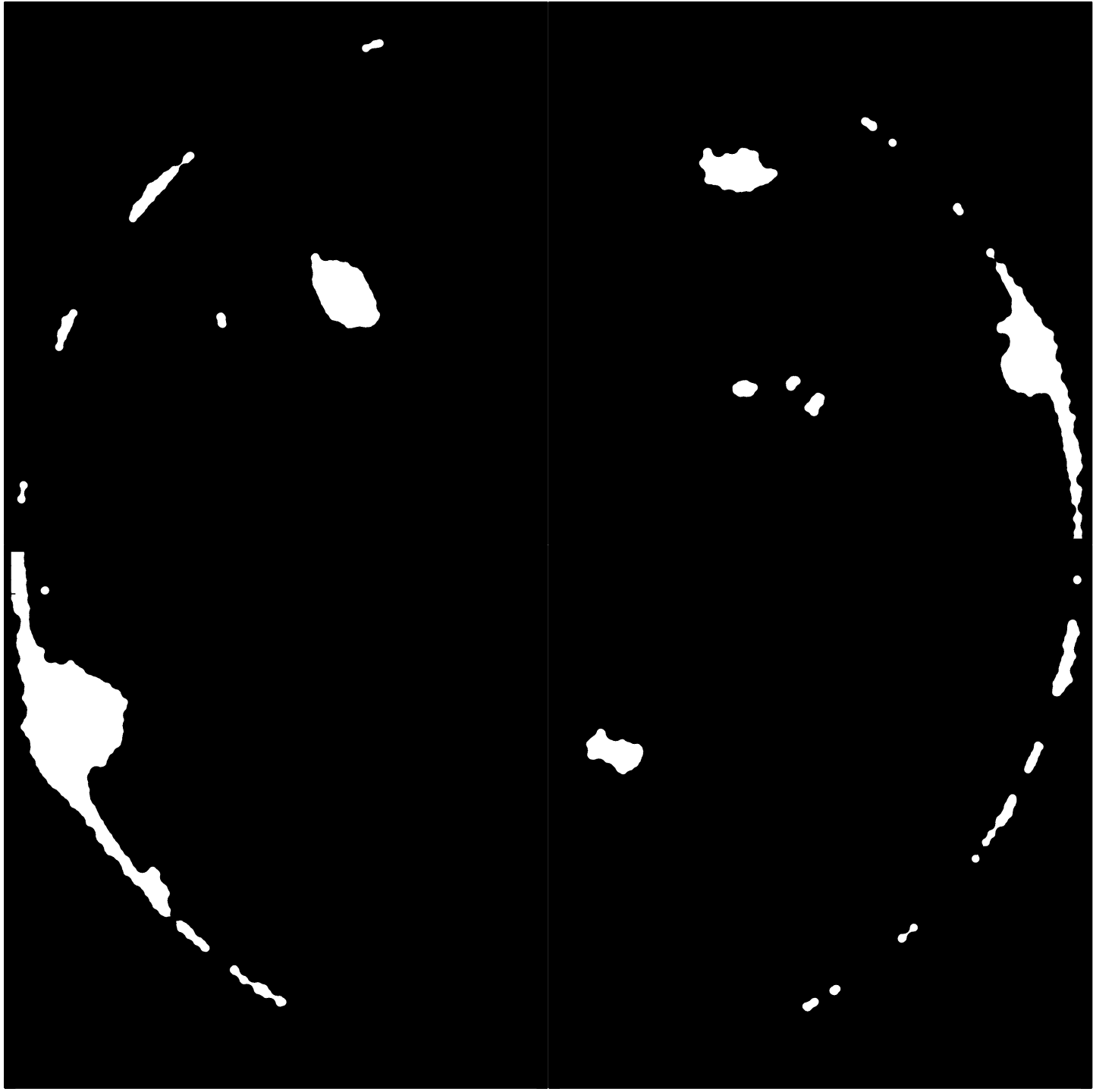
Dilate

Close

Dilate

Erode

94



Threshold

Open

Erode

Dilate

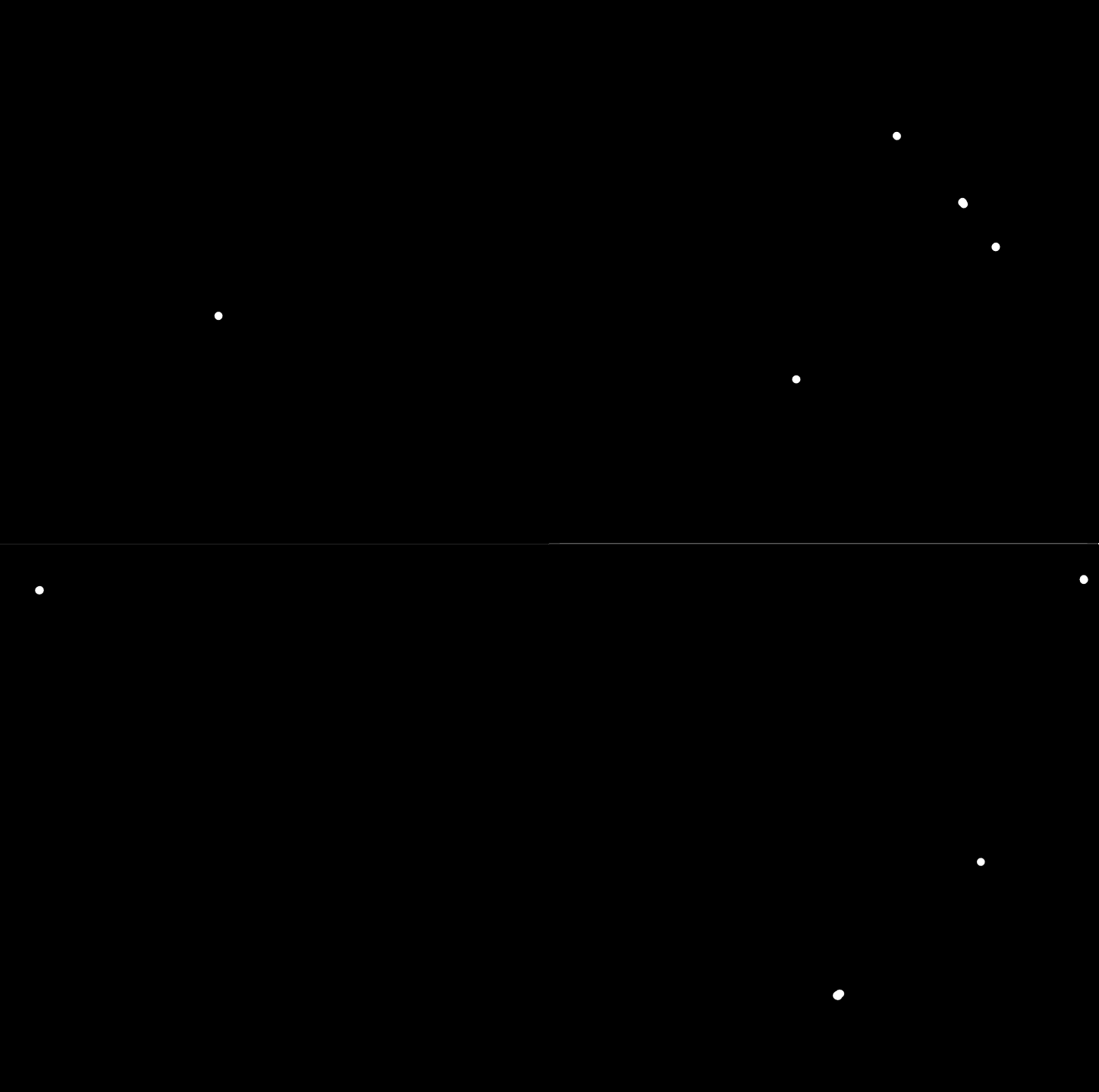
Close

Dilate

Erode

Hit or miss

Dilate





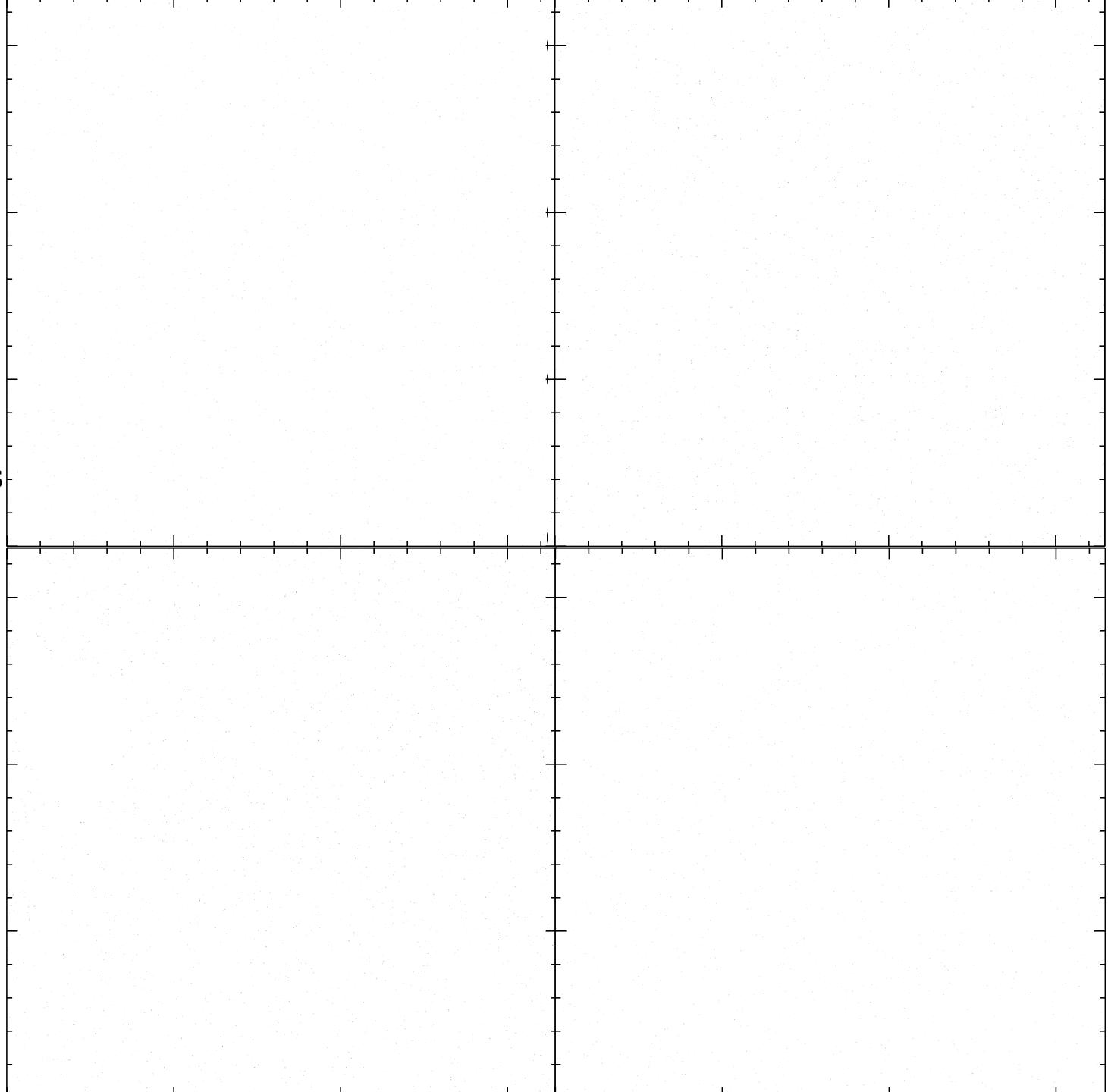
Threshold

Open  
Erode  
Dilate

Close  
Dilate  
Erode

Hit or miss  
Dilate

Threshold



Threshold

Open

Erode

Dilate

Close

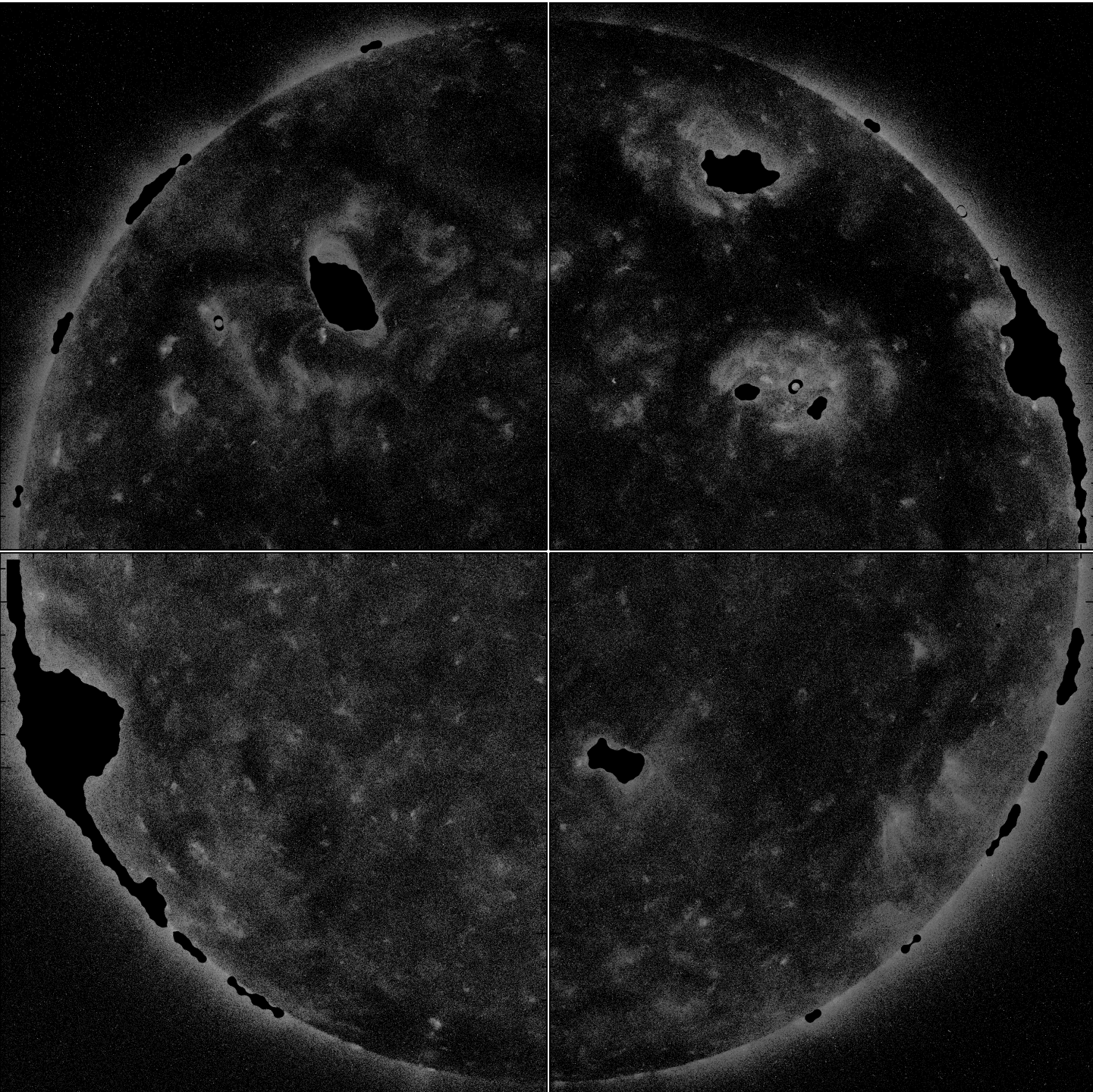
Dilate

Erode

Hit or miss

Dilate

Threshold



Threshold

Open

Erode

Dilate

Close

Dilate

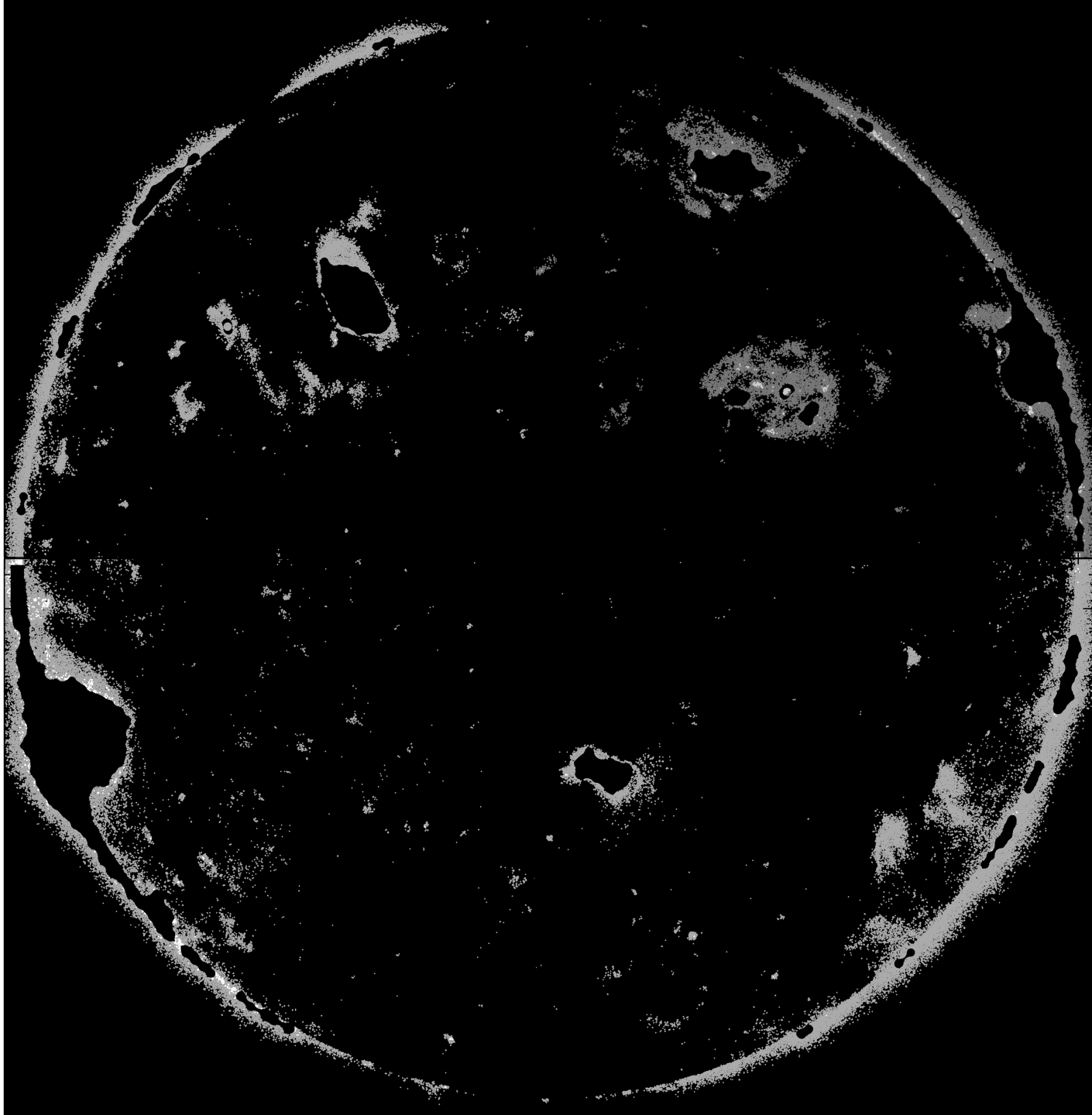
Erode

Hit or miss

Dilate

Threshold

Open



Threshold

Open

Erode

Dilate

Close

Dilate

Erode

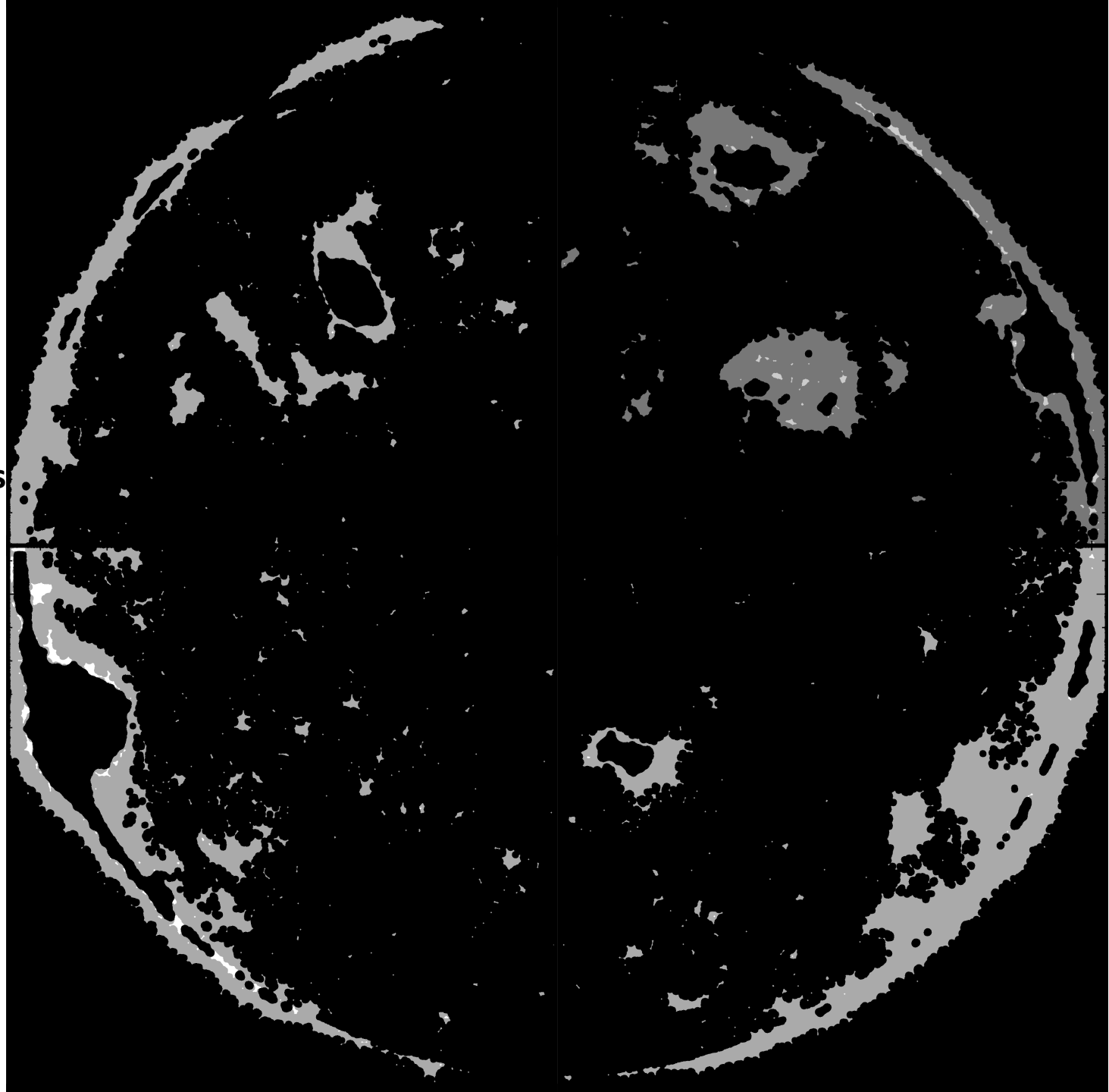
Hit or miss

Dilate

Threshold

Open

Close



Threshold

Open

Erode

Dilate

Close

Dilate

Erode

Hit or miss

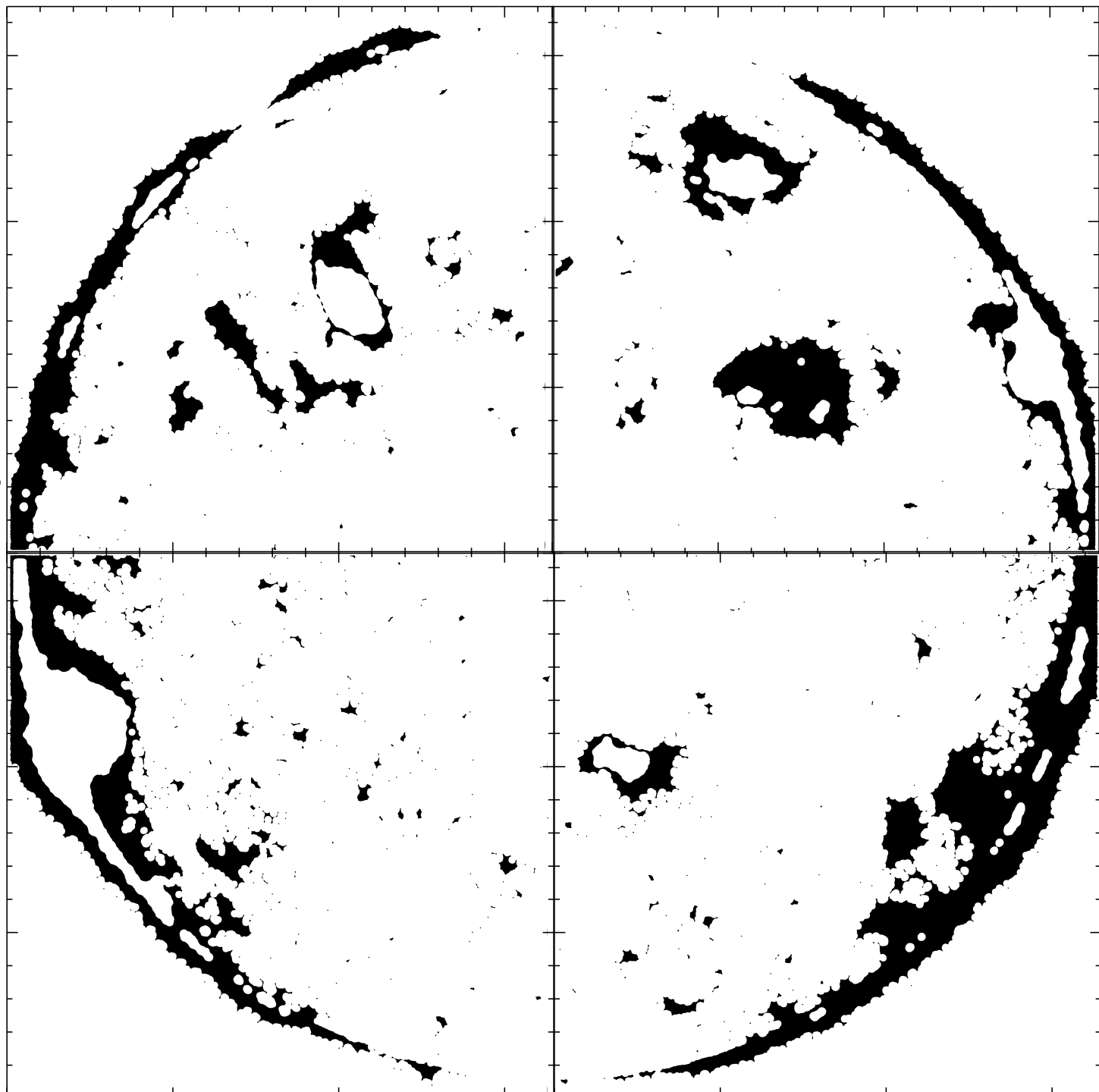
Dilate

Threshold

Open

Close

Contour



Threshold

Open

Erode

Dilate

Close

Dilate

Erode

Hit or miss

Dilate

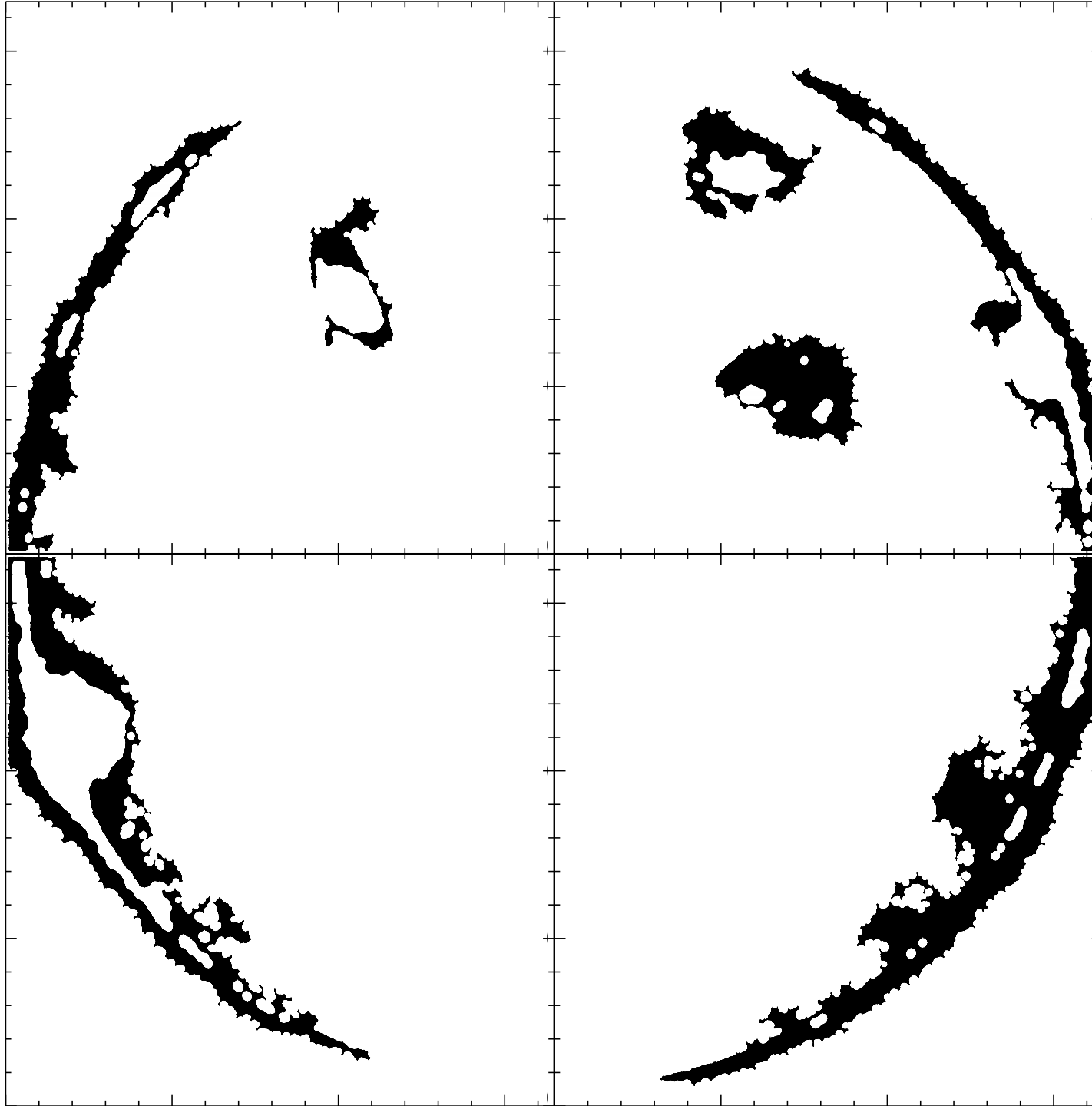
Threshold

Open

Close

Contour

Area



Threshold

Open

Erode

Dilate

Close

Dilate

Erode

Hit or miss

Dilate

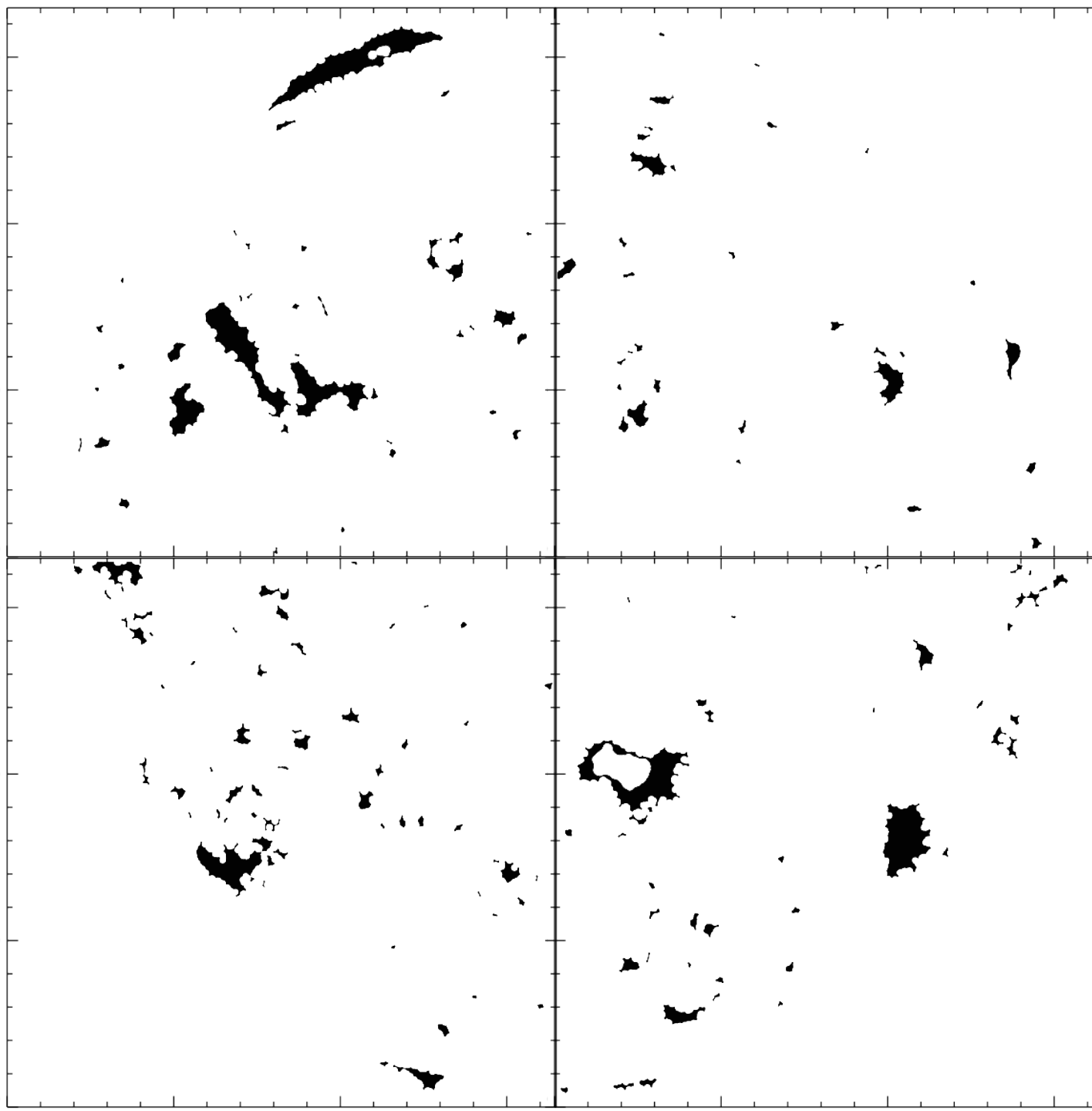
Threshold

Open

Close

Contour

Area





Threshold

Open

Erode

Dilate

Close

Dilate

Erode

Hit or miss

Dilate

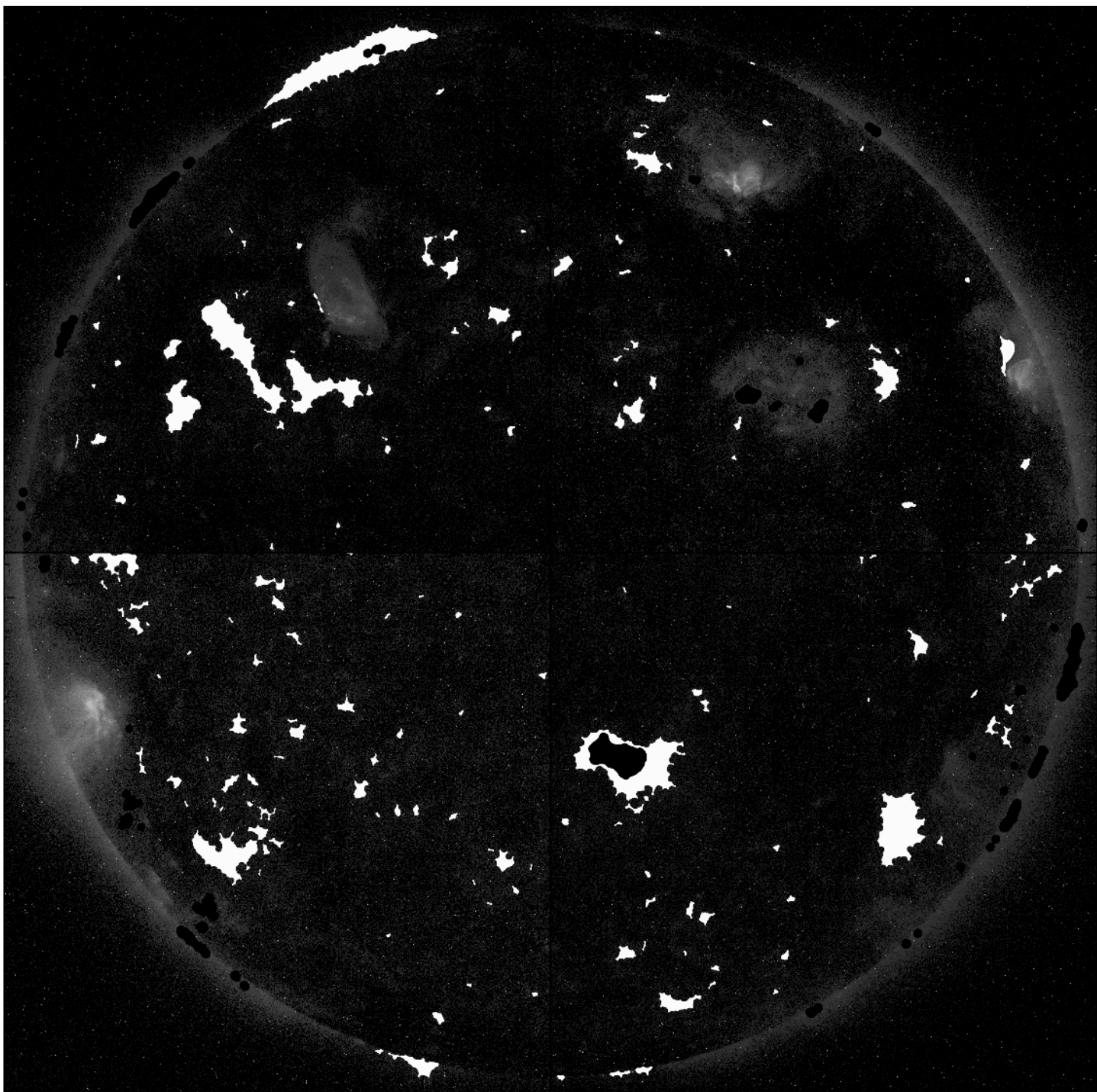
Threshold

Open

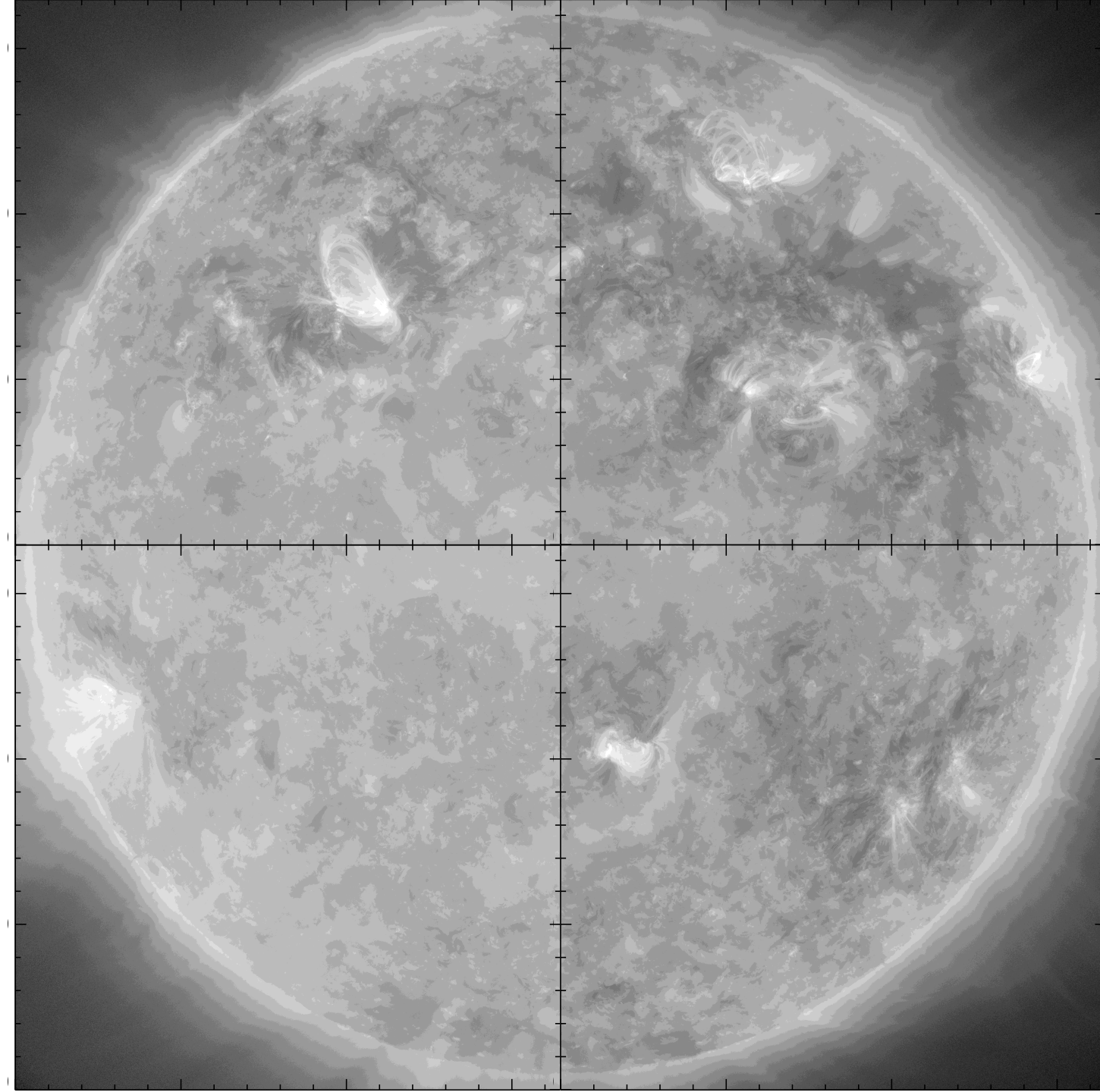
Close

Contour

Area

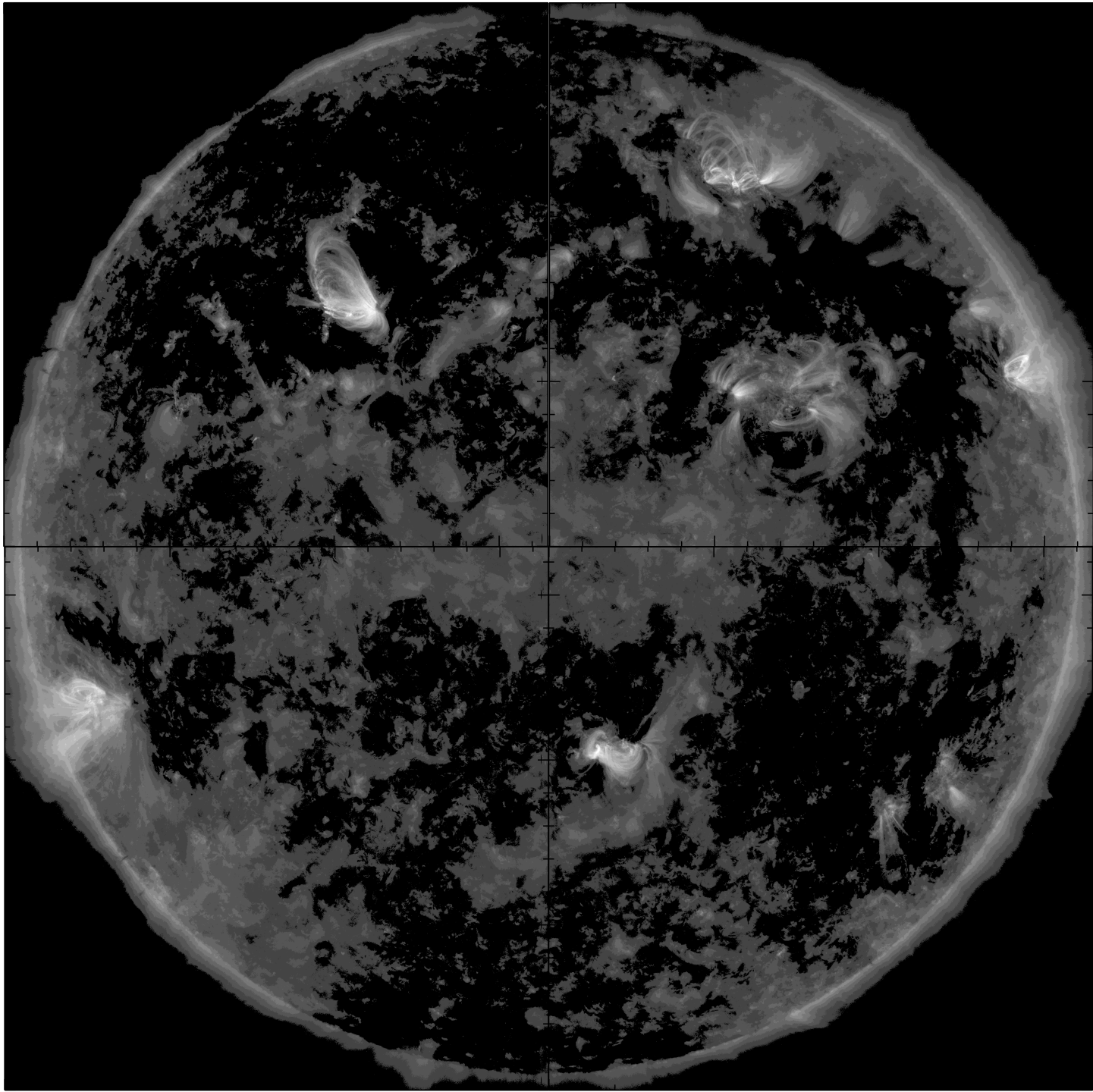


**171 Å - SDO AIA**



Threshold

171



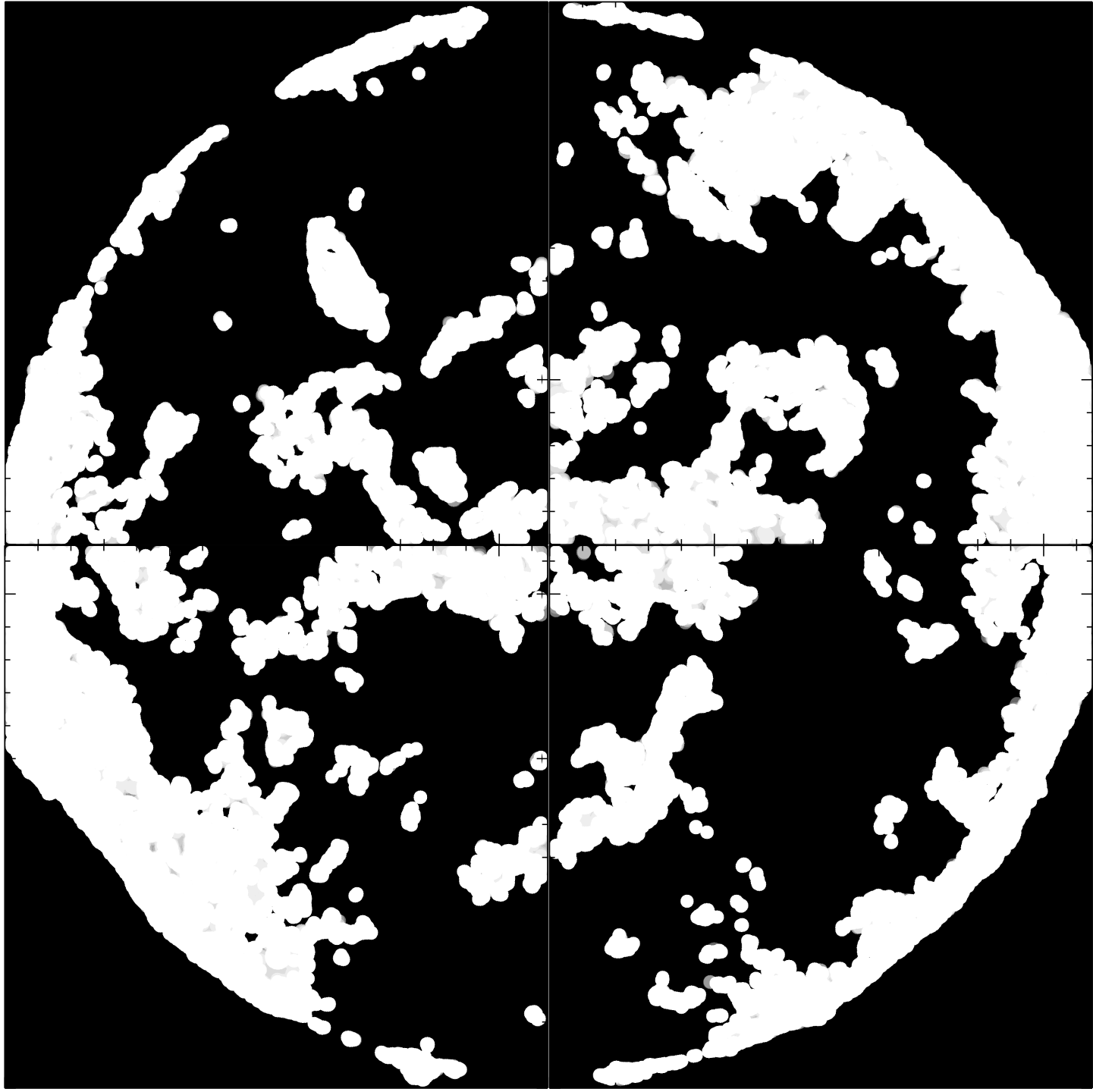
Threshold

Open

Erode

Dilate

171



Threshold

Open

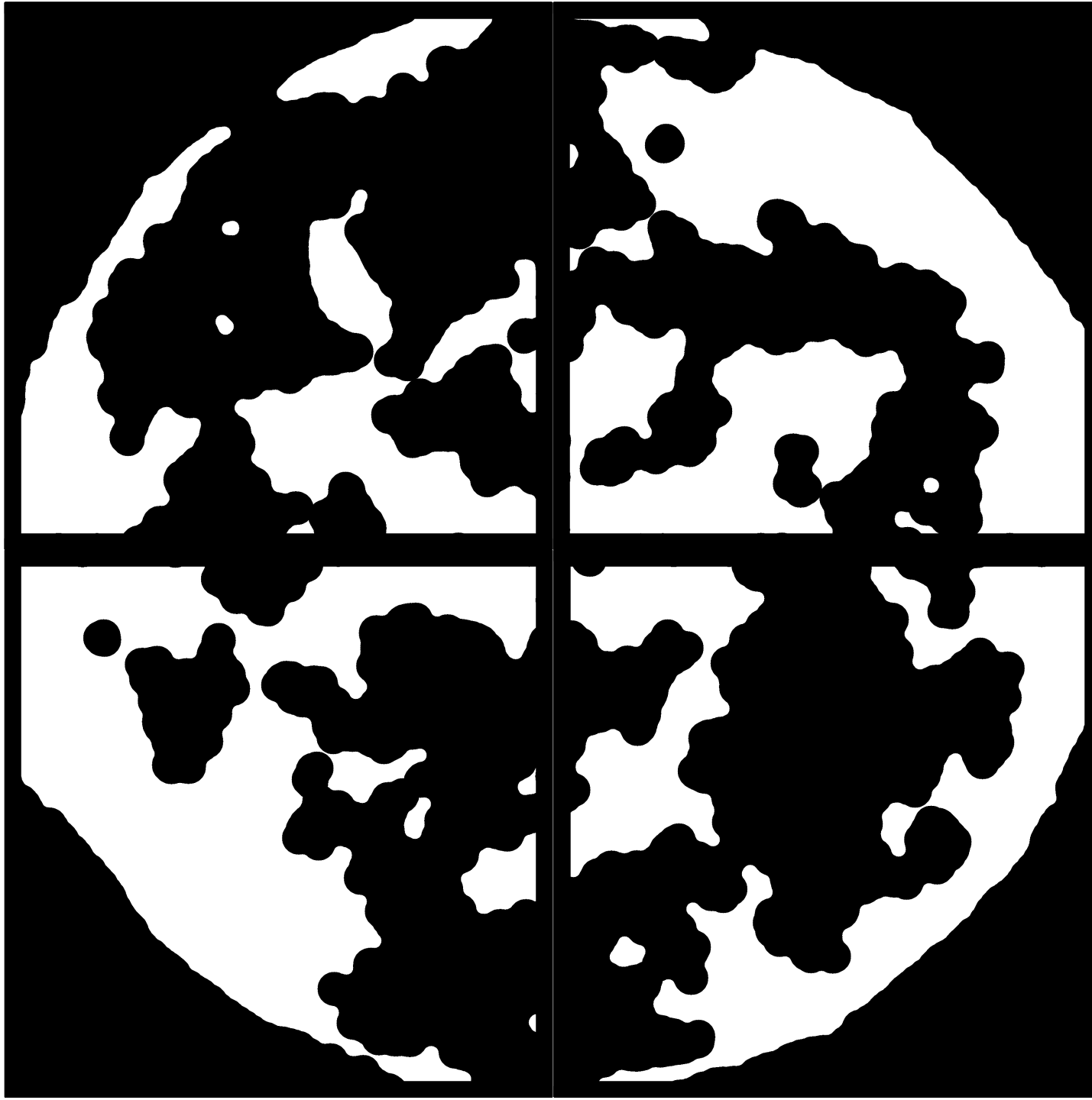
Erode

Dilate

Close

Dilate

Erode



Threshold

Open

Erode

Dilate

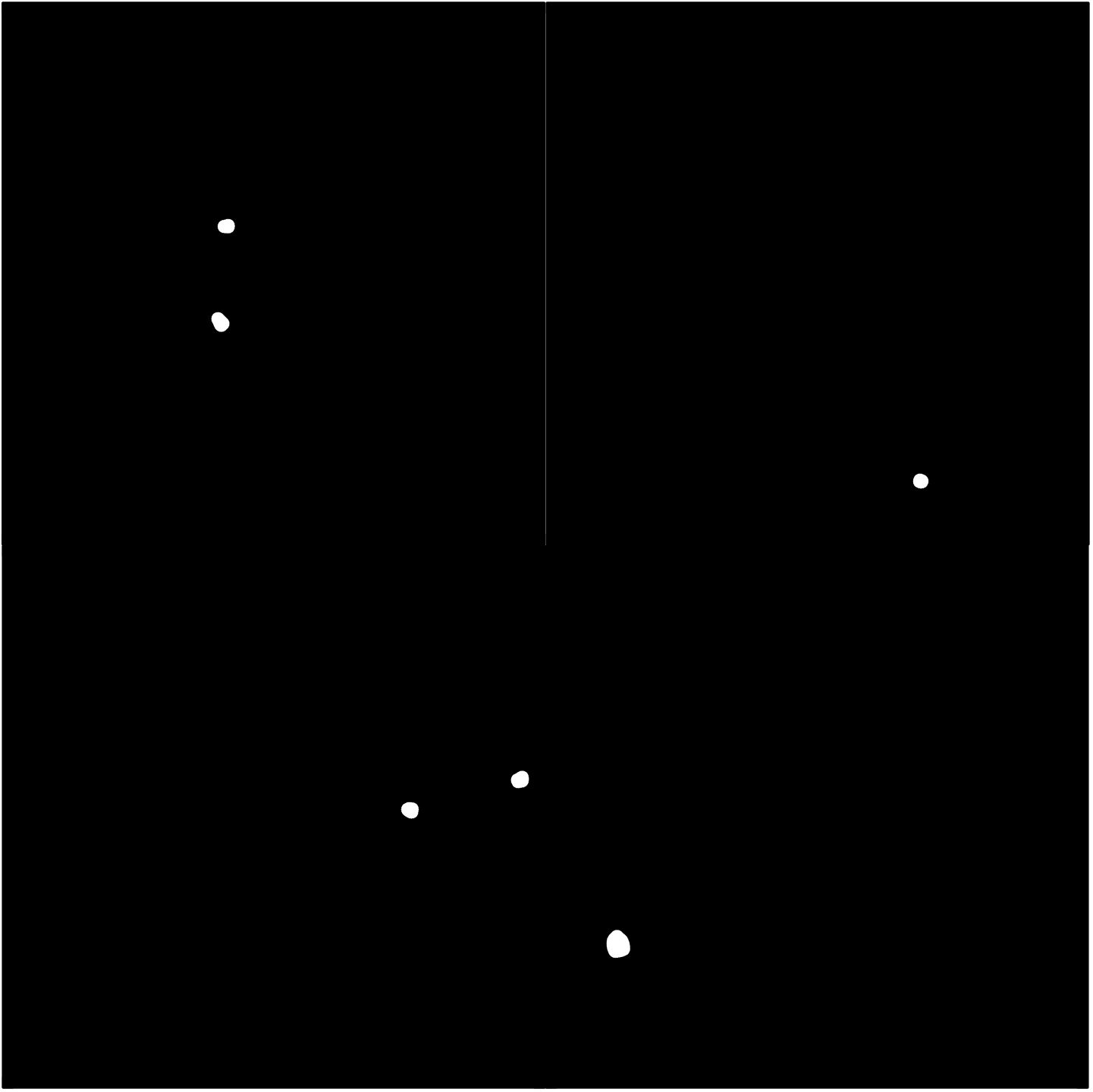
Close

Dilate

Erode

Hit or miss

Dilate





Threshold

Open

Erode

Dilate

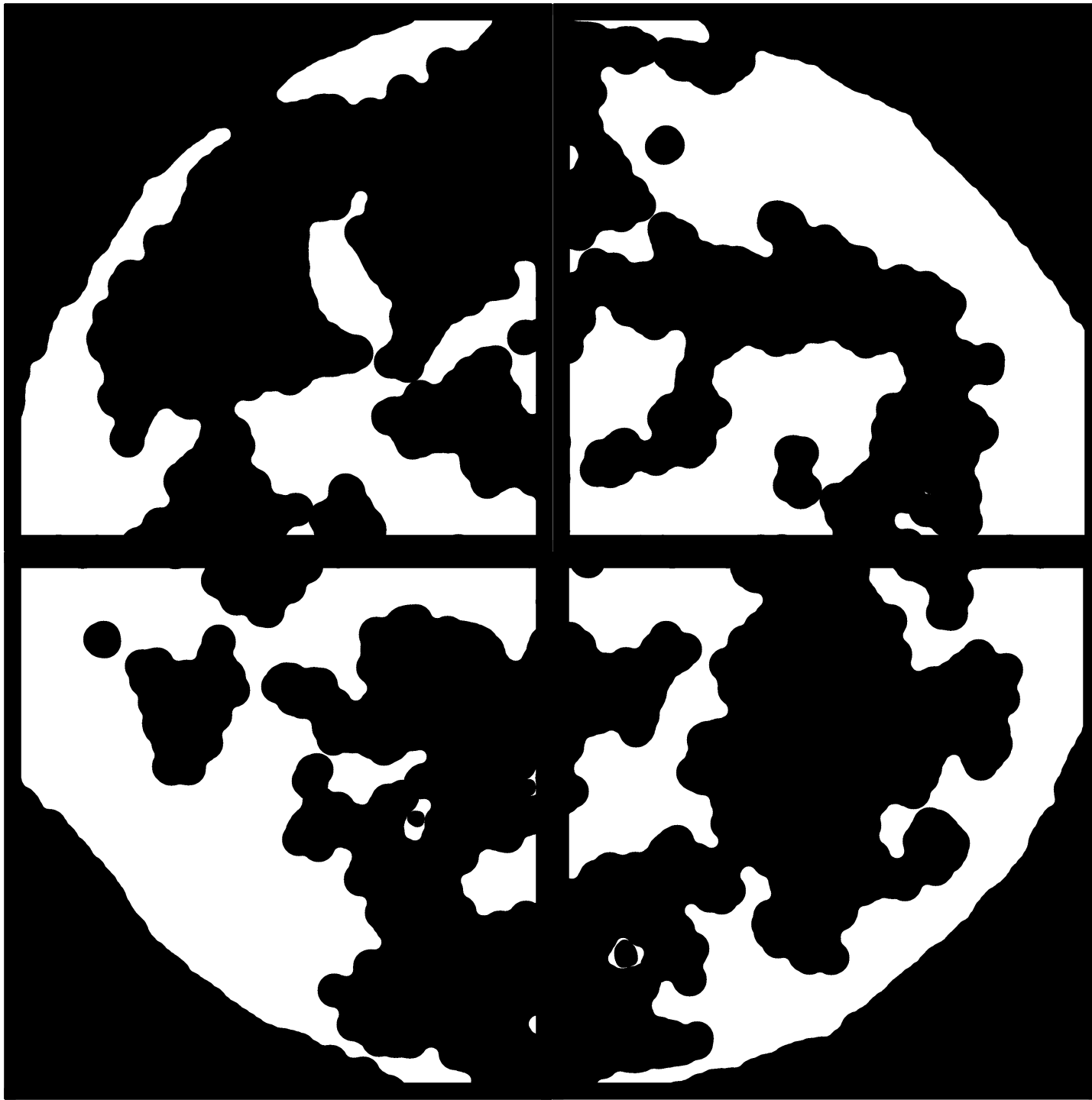
Close

Dilate

Erode

Hit or miss

Dilate



Threshold

Open

Erode

Dilate

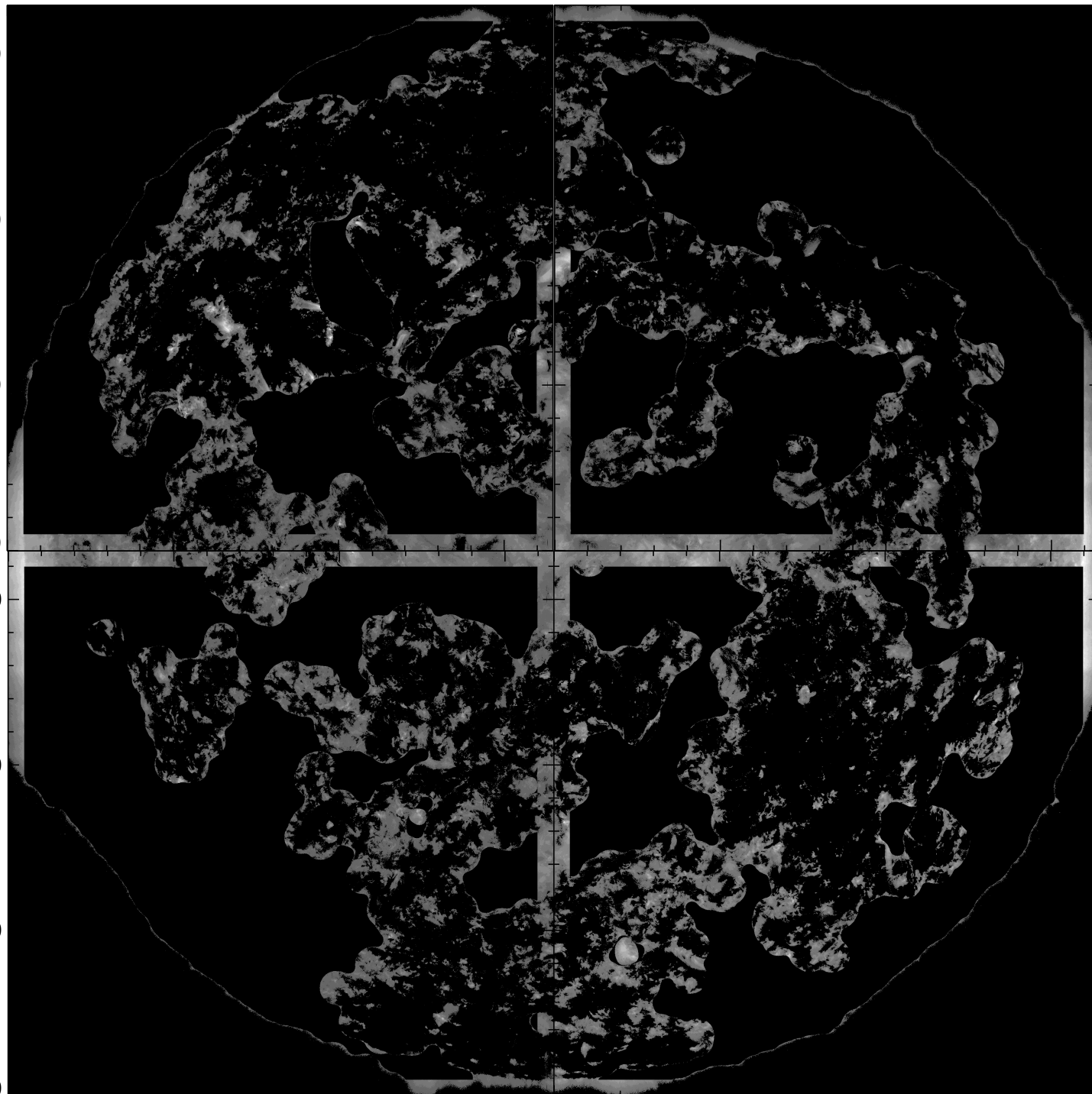
Close

Dilate

Erode

Hit or miss

Dilate



Threshold

Open

Erode

Dilate

Close

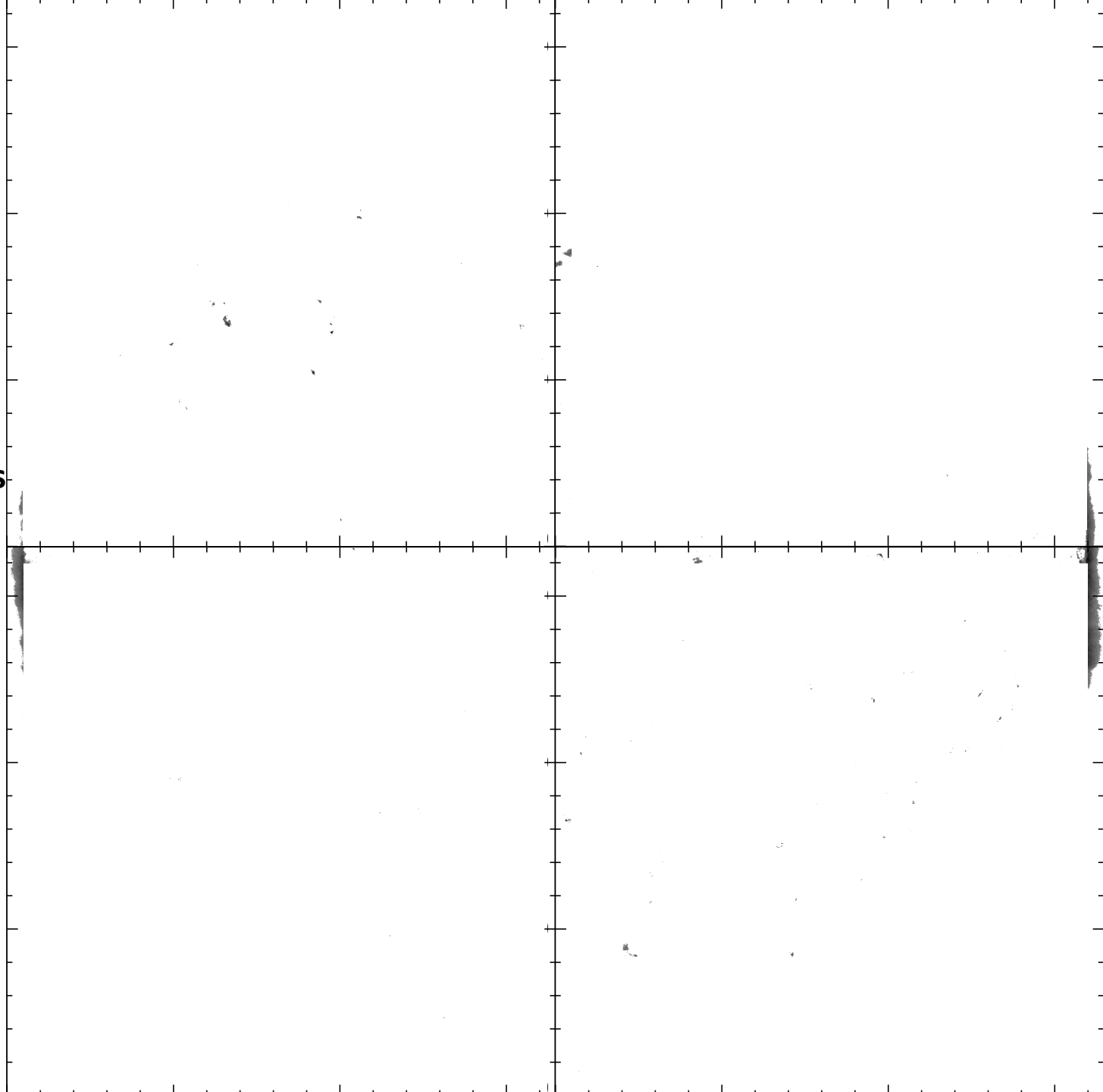
Dilate

Erode

Hit or miss

Dilate

Threshold



Threshold

Open

Erode

Dilate

Close

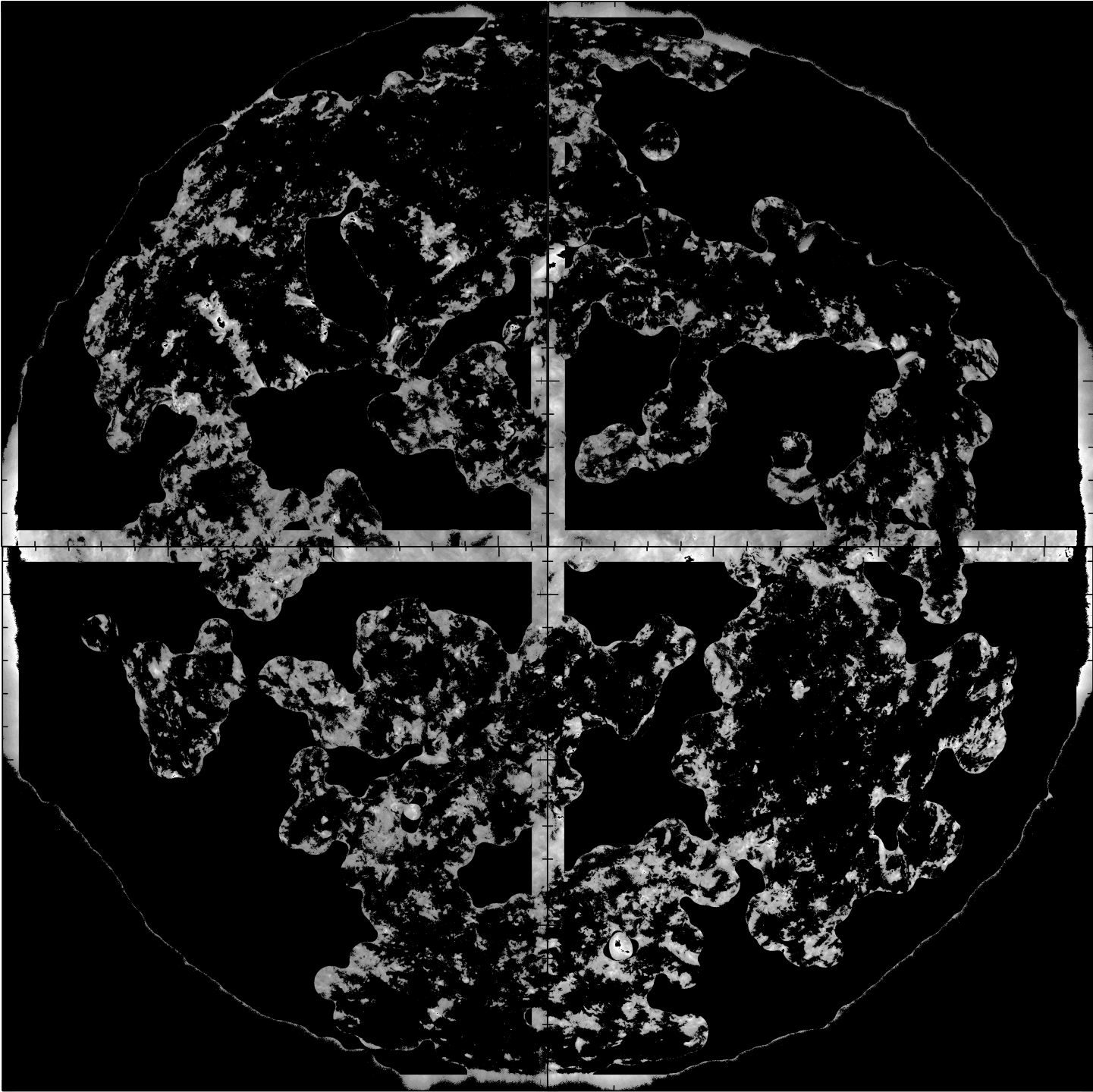
Dilate

Erode

Hit or miss

Dilate

Threshold



Threshold

Open

Erode

Dilate

Close

Dilate

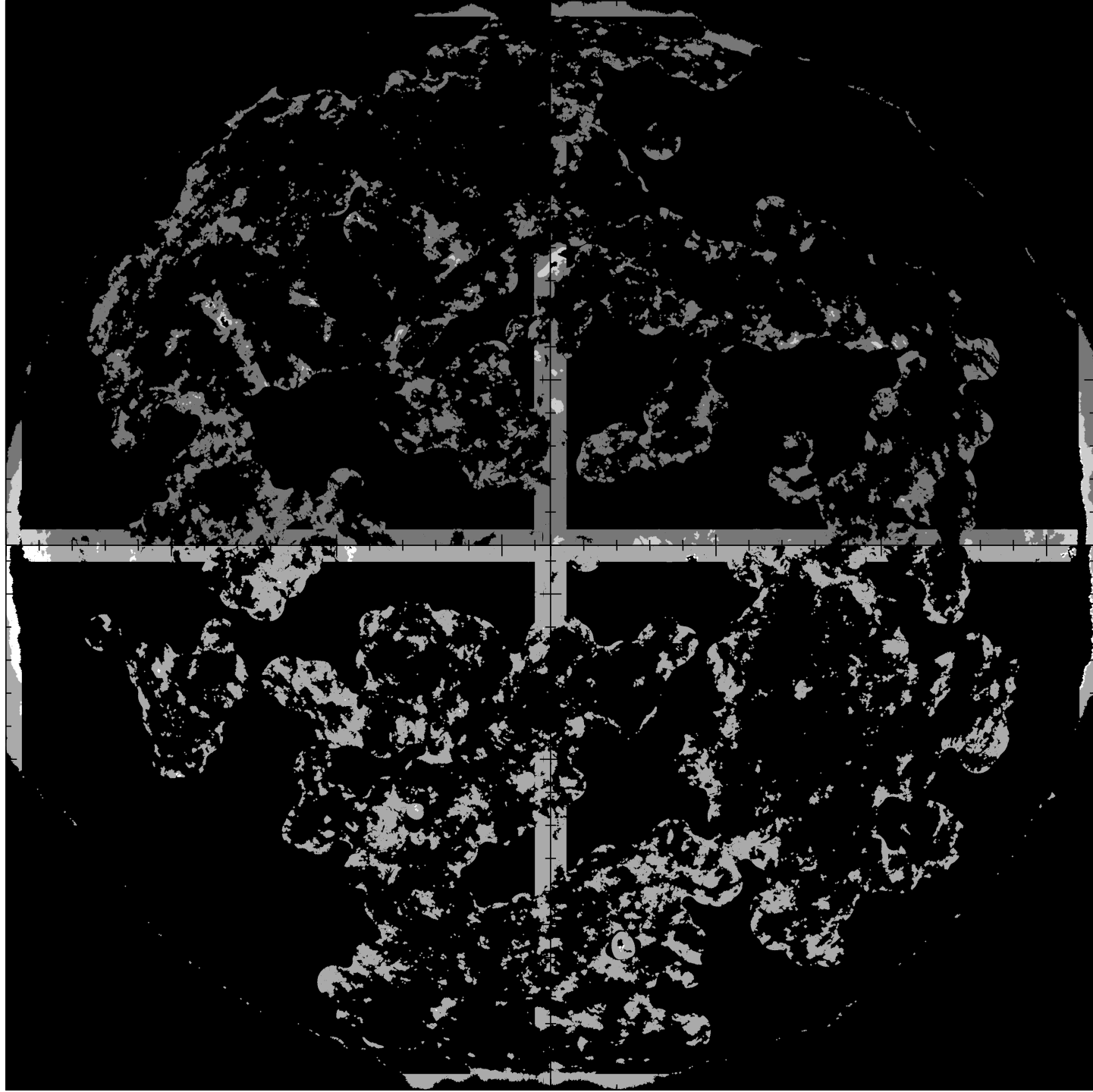
Erode

Hit or miss

Dilate

Threshold

Open



Threshold

Open

Erode

Dilate

Close

Dilate

Erode

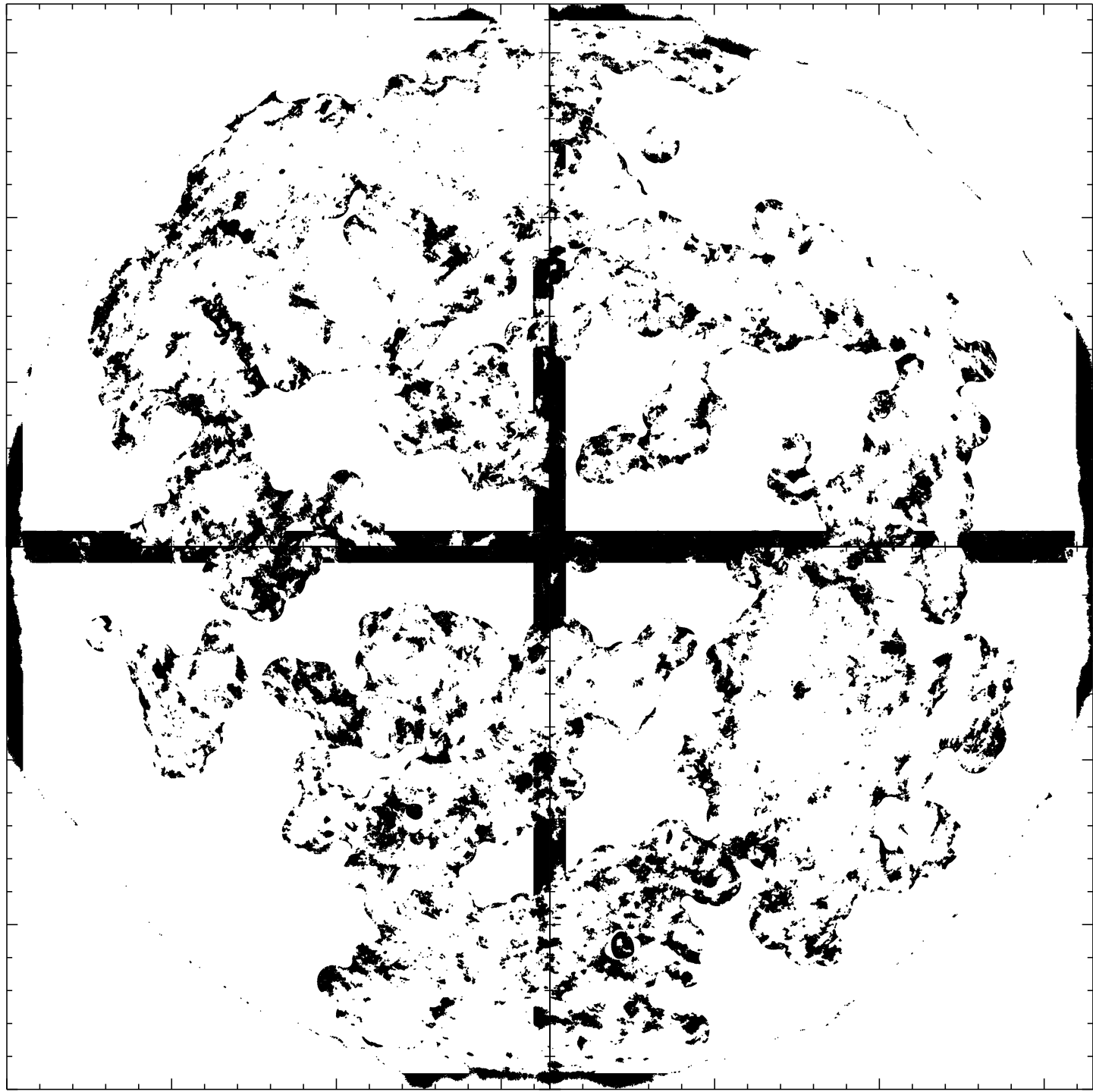
Hit or miss

Dilate

Threshold

Open

Contour



Threshold

Open

Erode

Dilate

Close

Dilate

Erode

Hit or miss

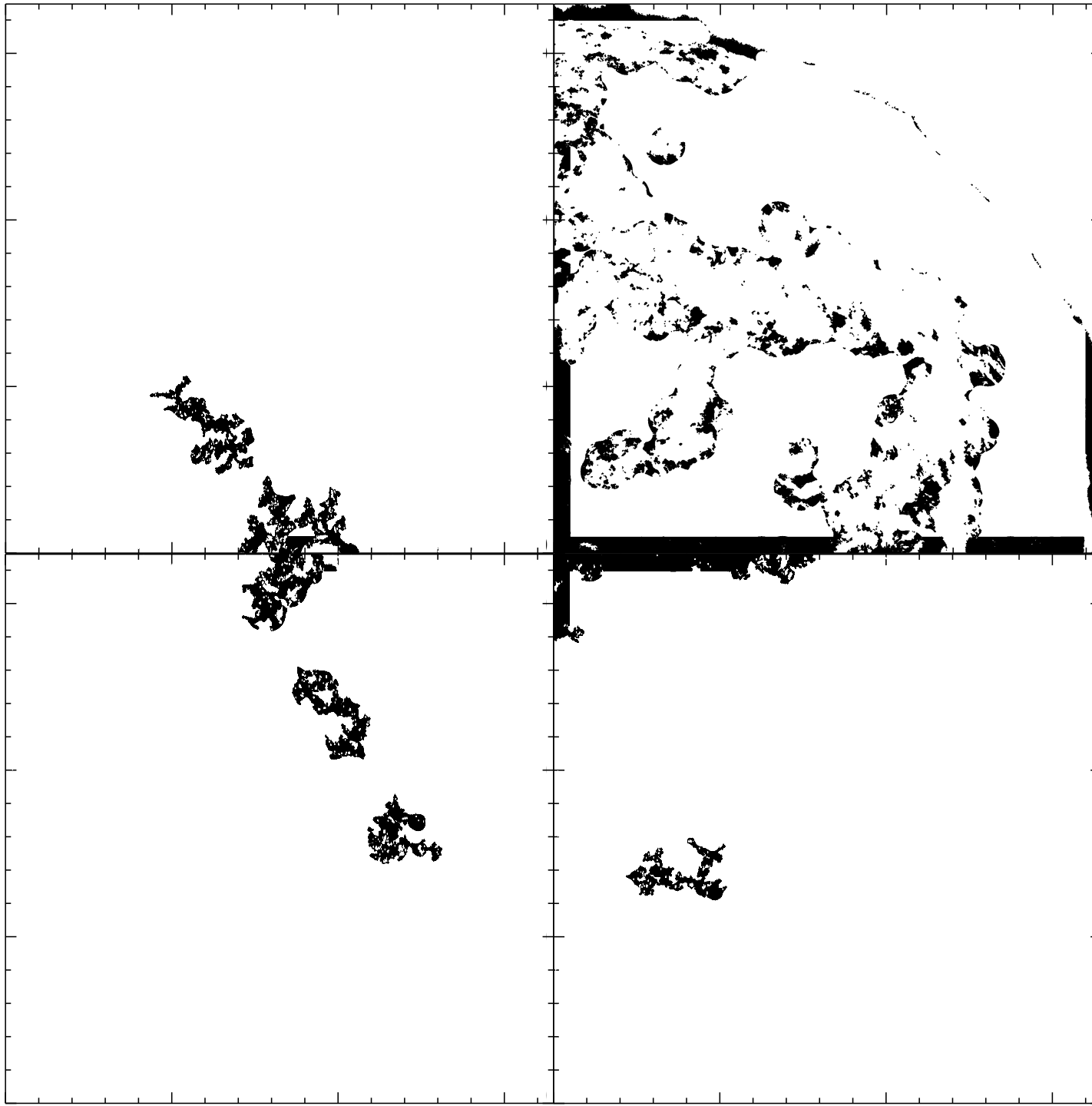
Dilate

Threshold

Open

Contour

Area





Threshold

Open

Erode

Dilate

Close

Dilate

Erode

Hit or miss

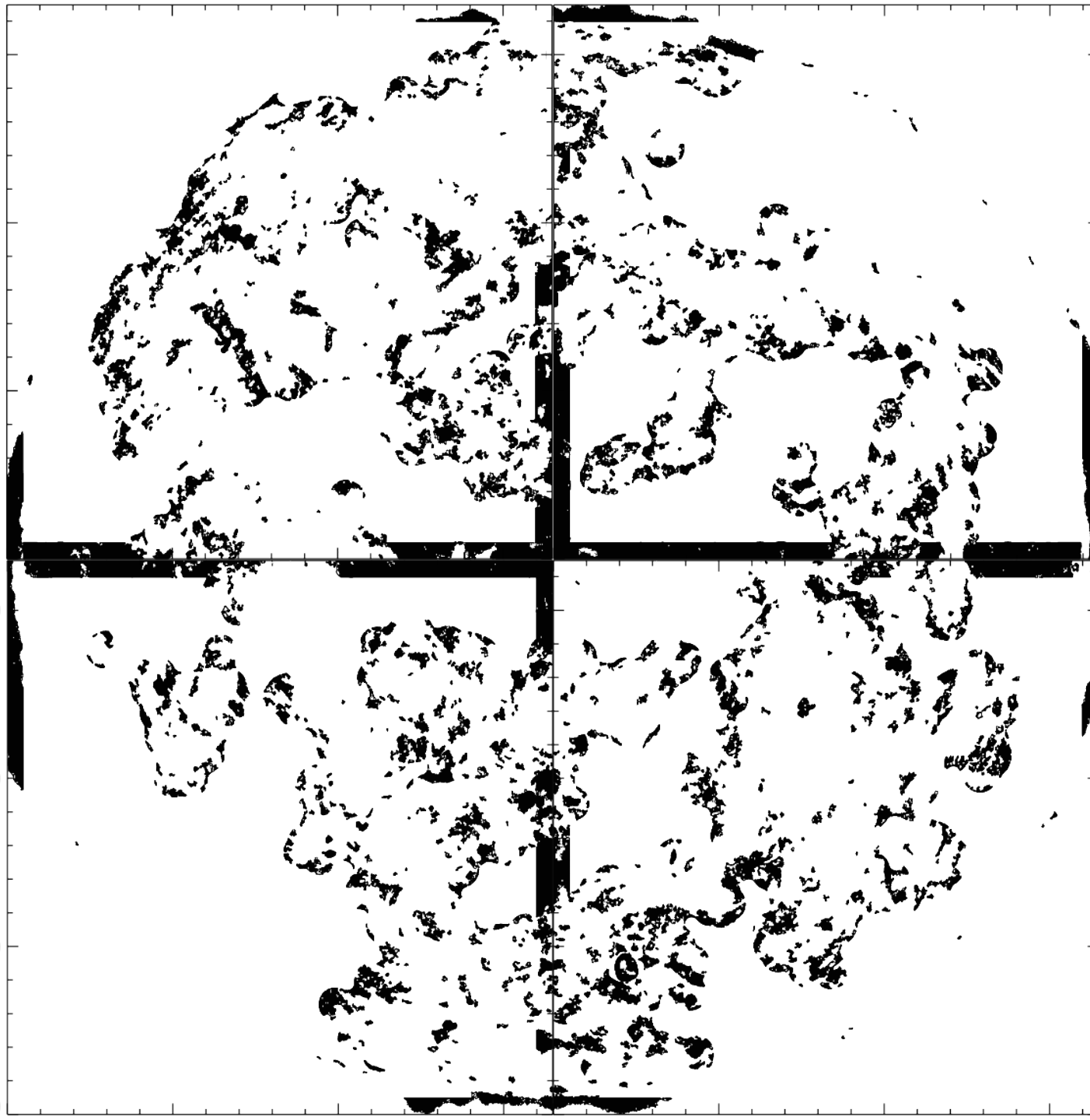
Dilate

Threshold

Open

Contour

Area



Threshold

Open

Erode

Dilate

Close

Dilate

Erode

Hit or miss

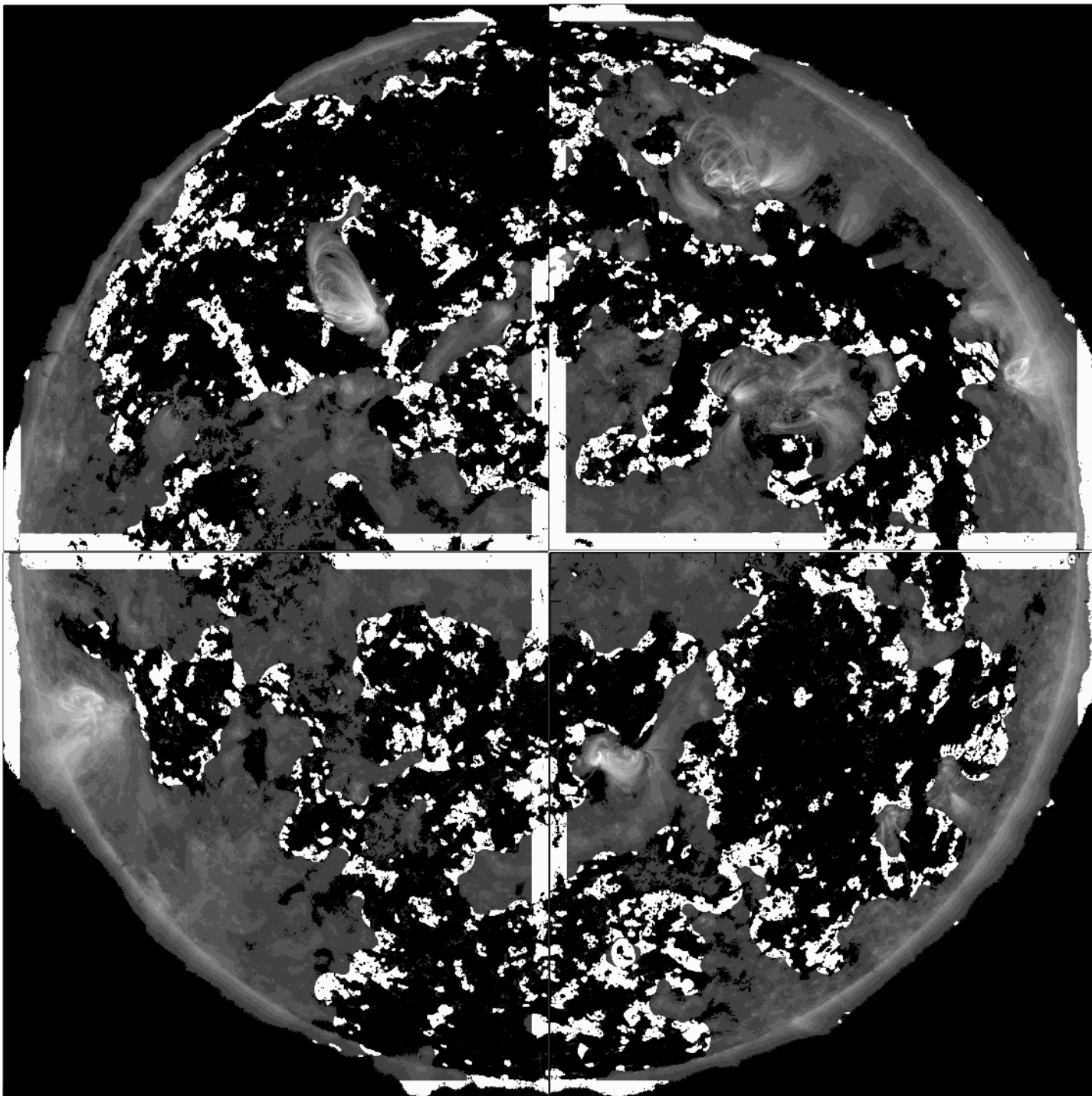
Dilate

Threshold

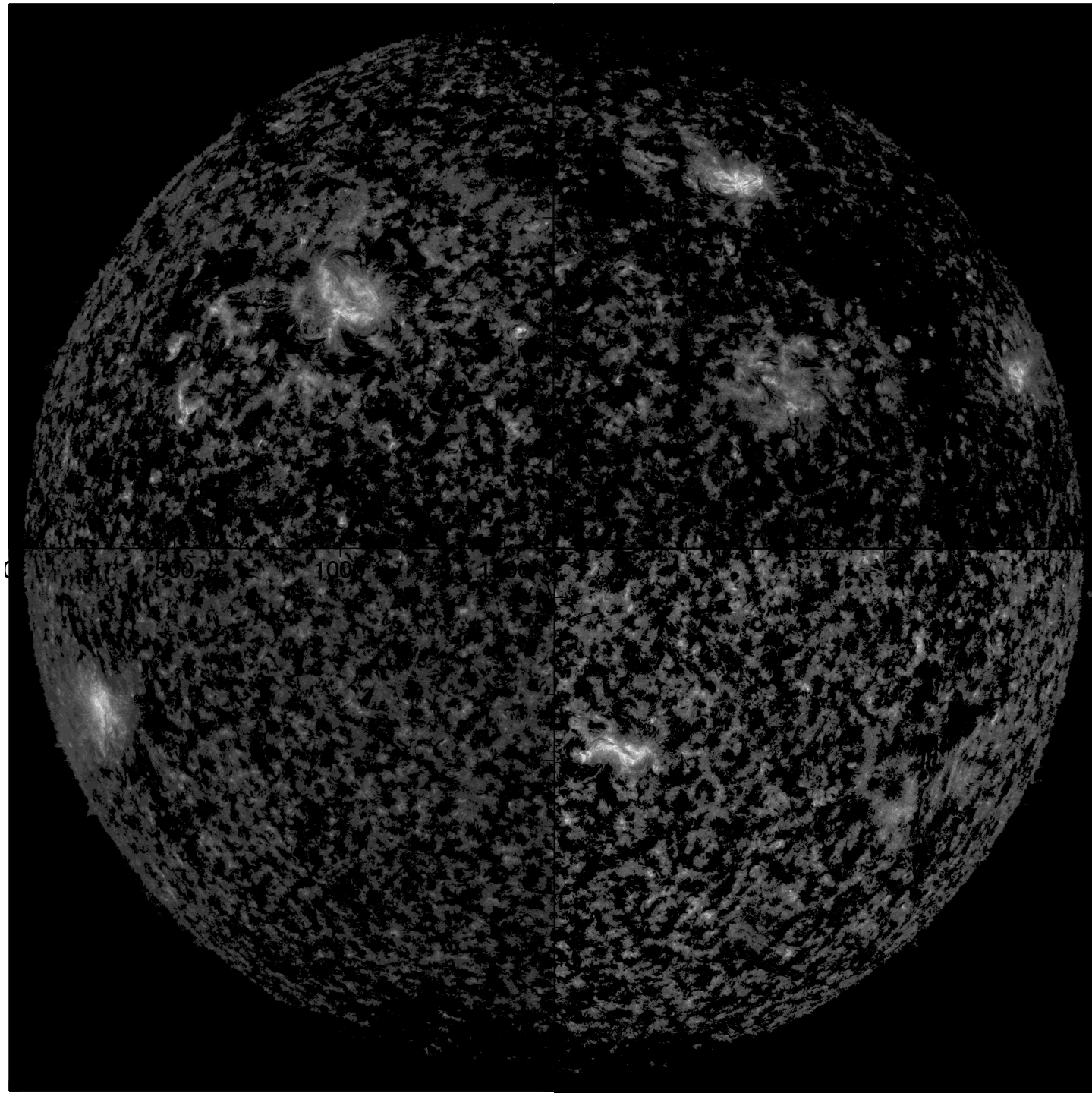
Open

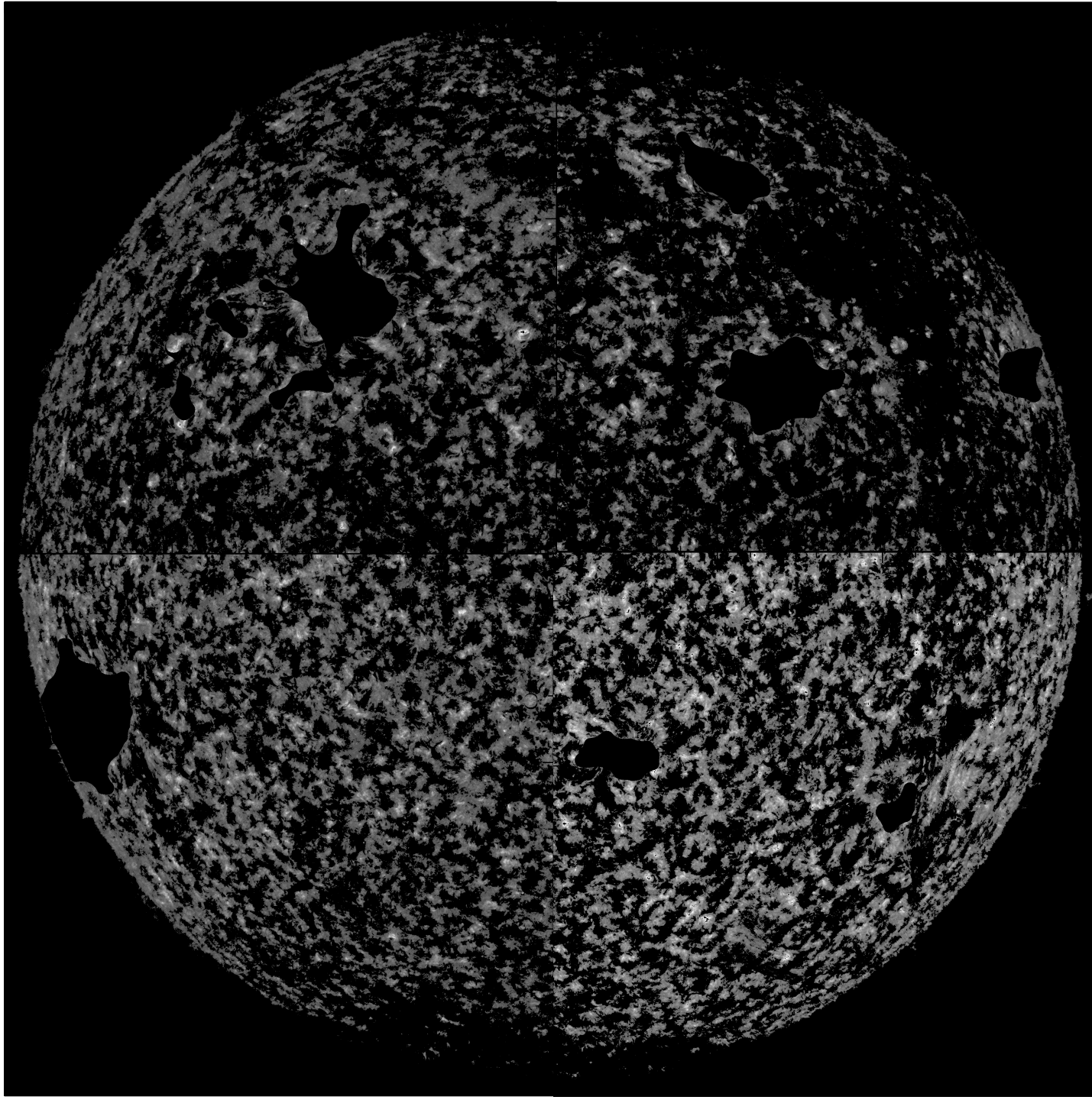
Contour

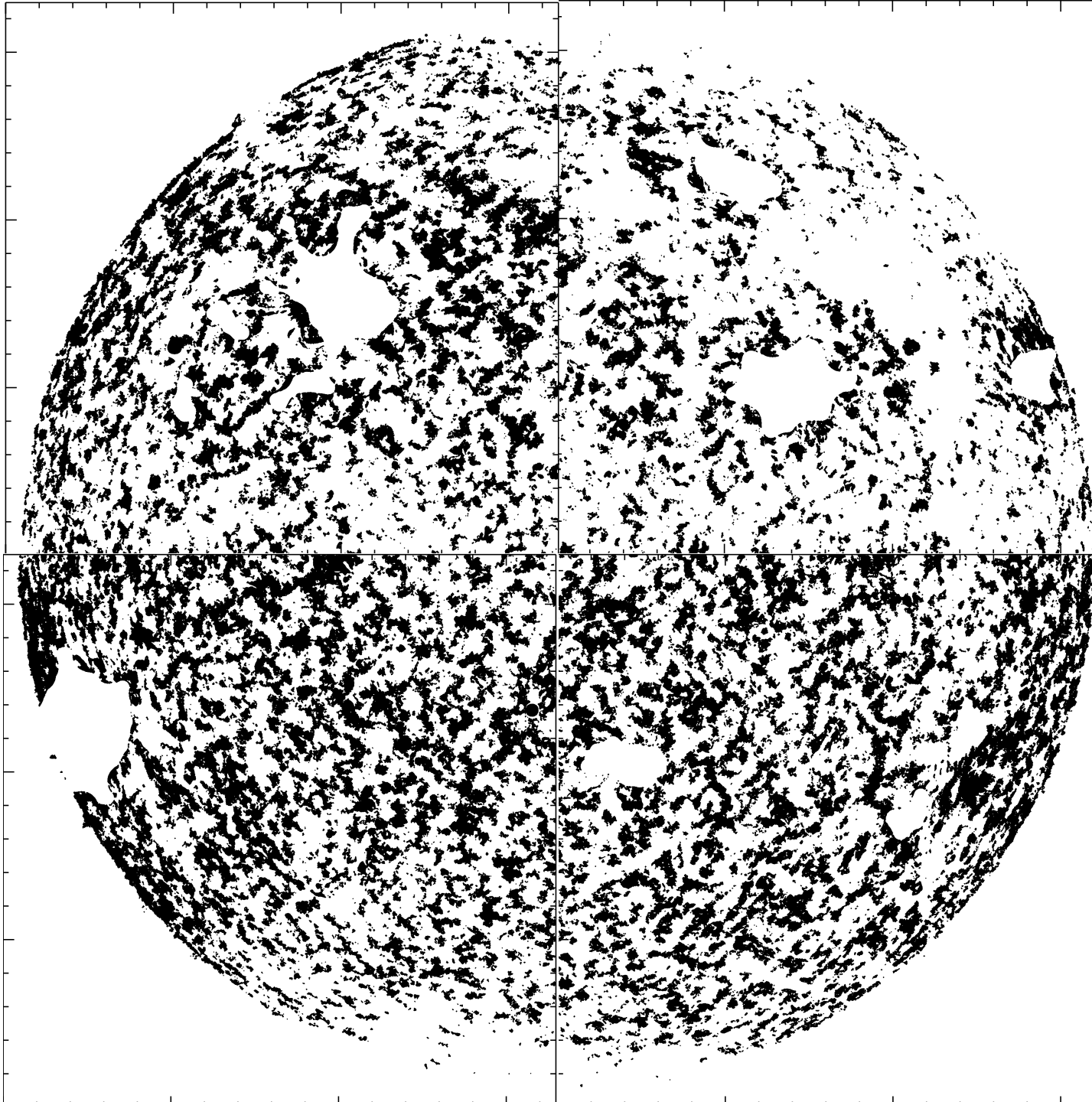
Area

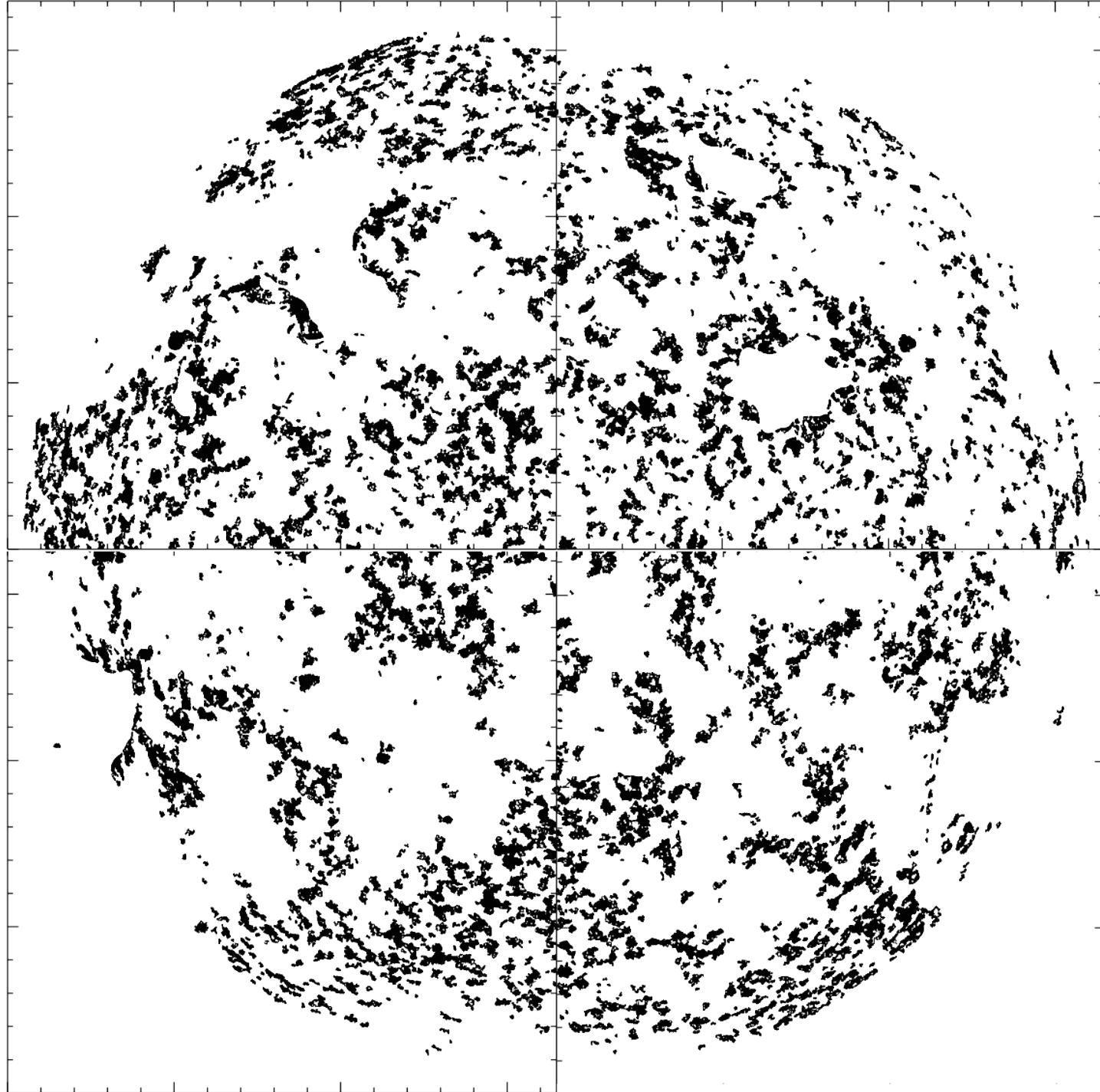


**304 Å - SDO AIA**

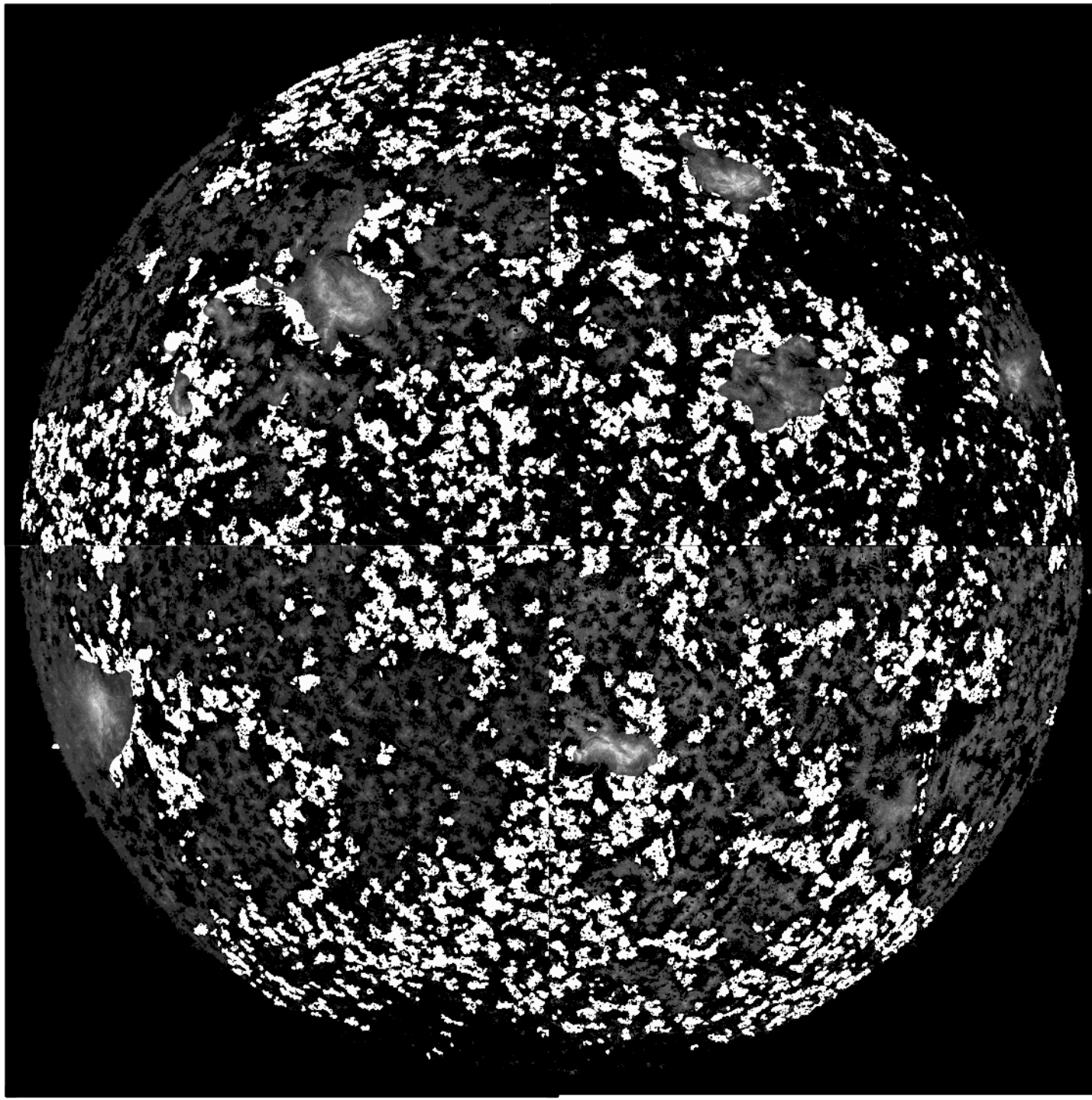






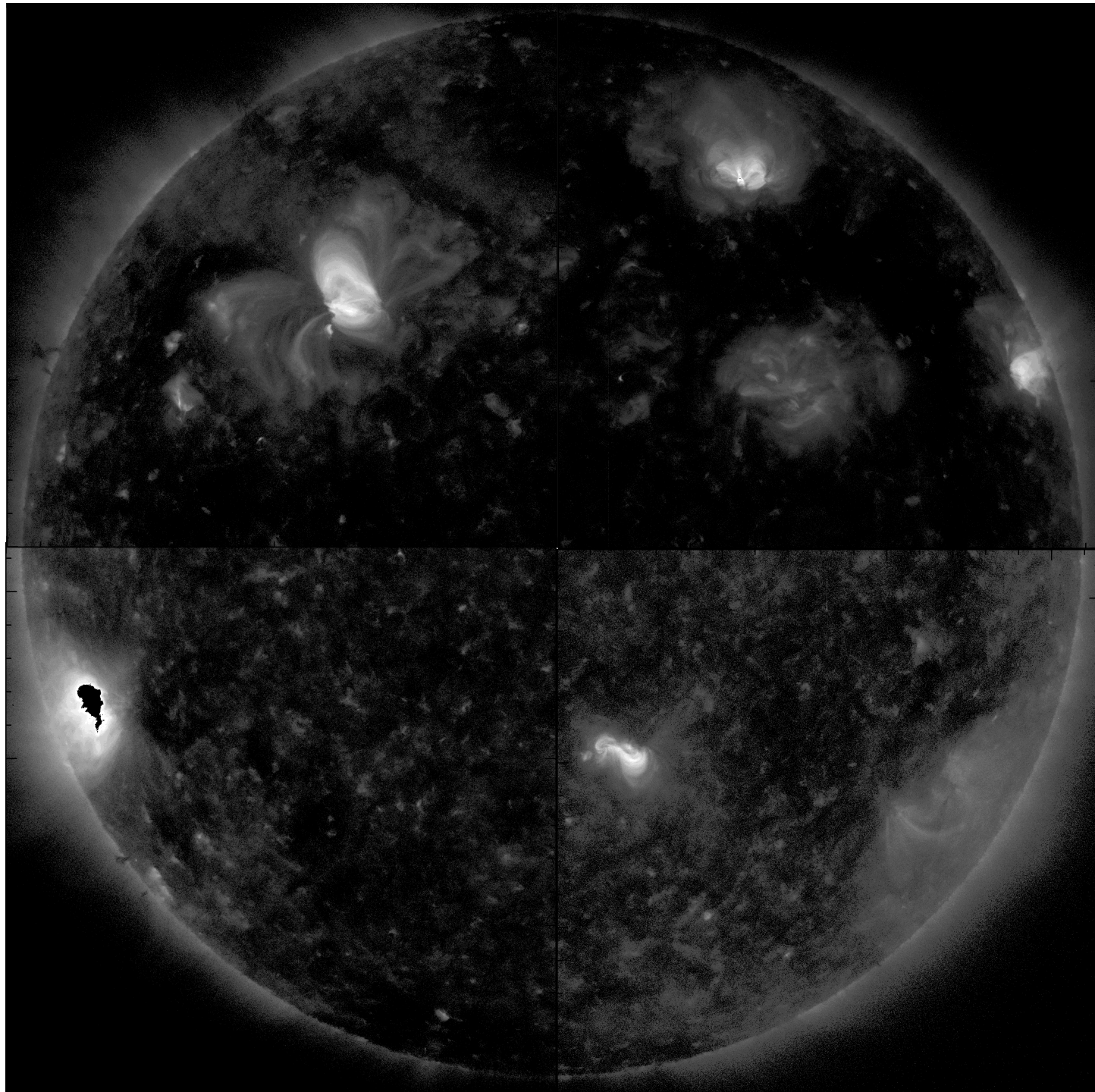


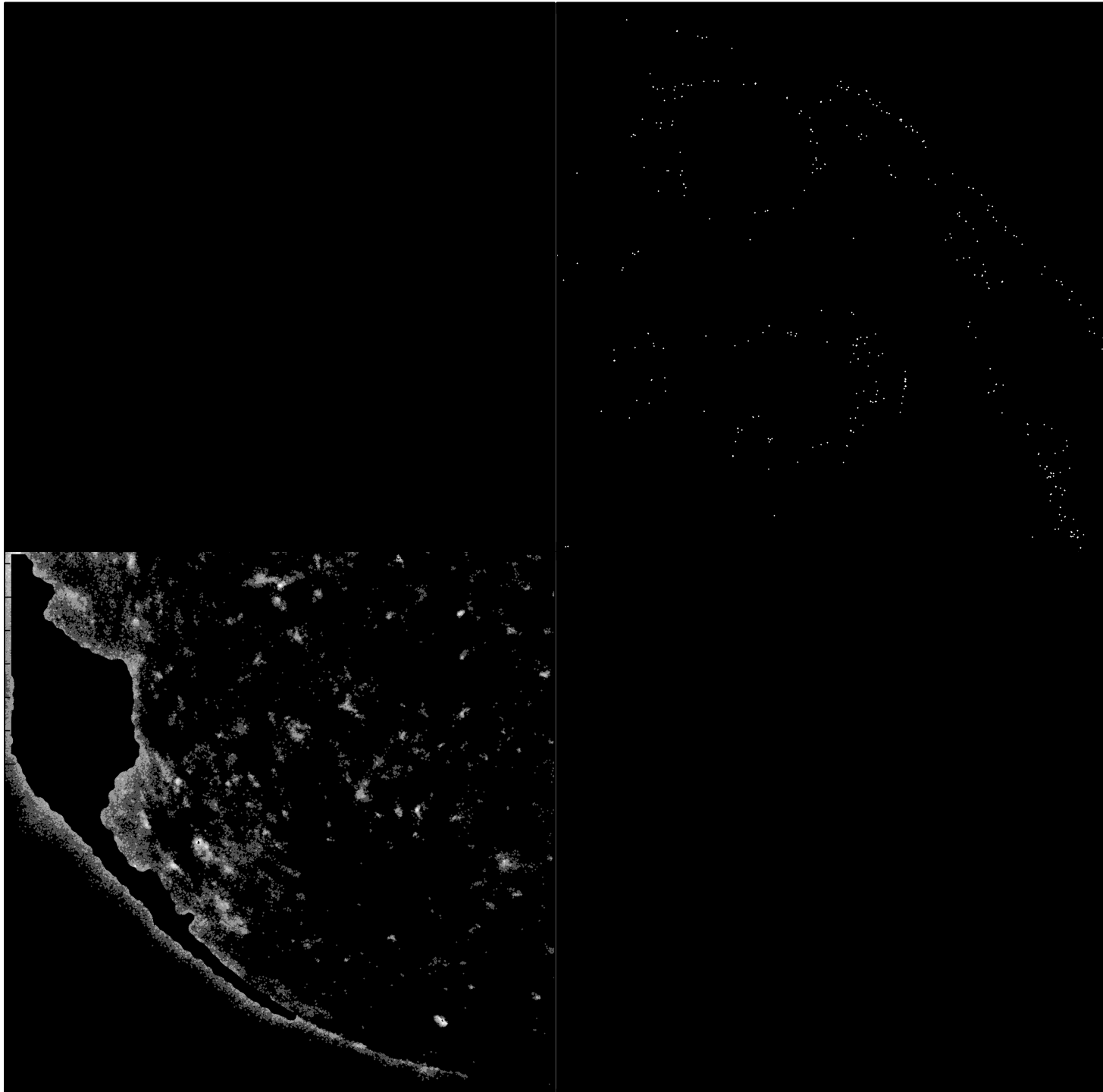


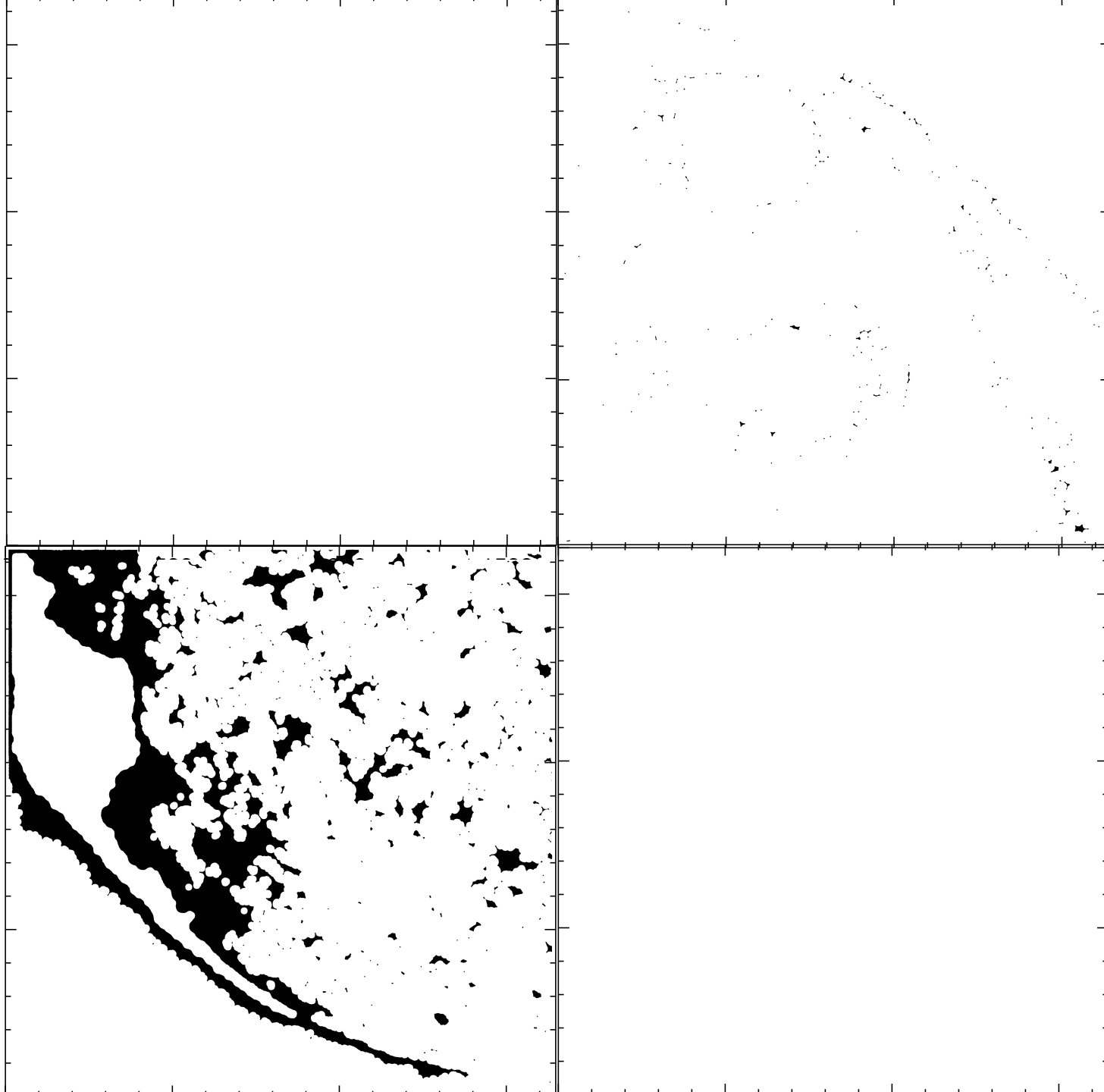


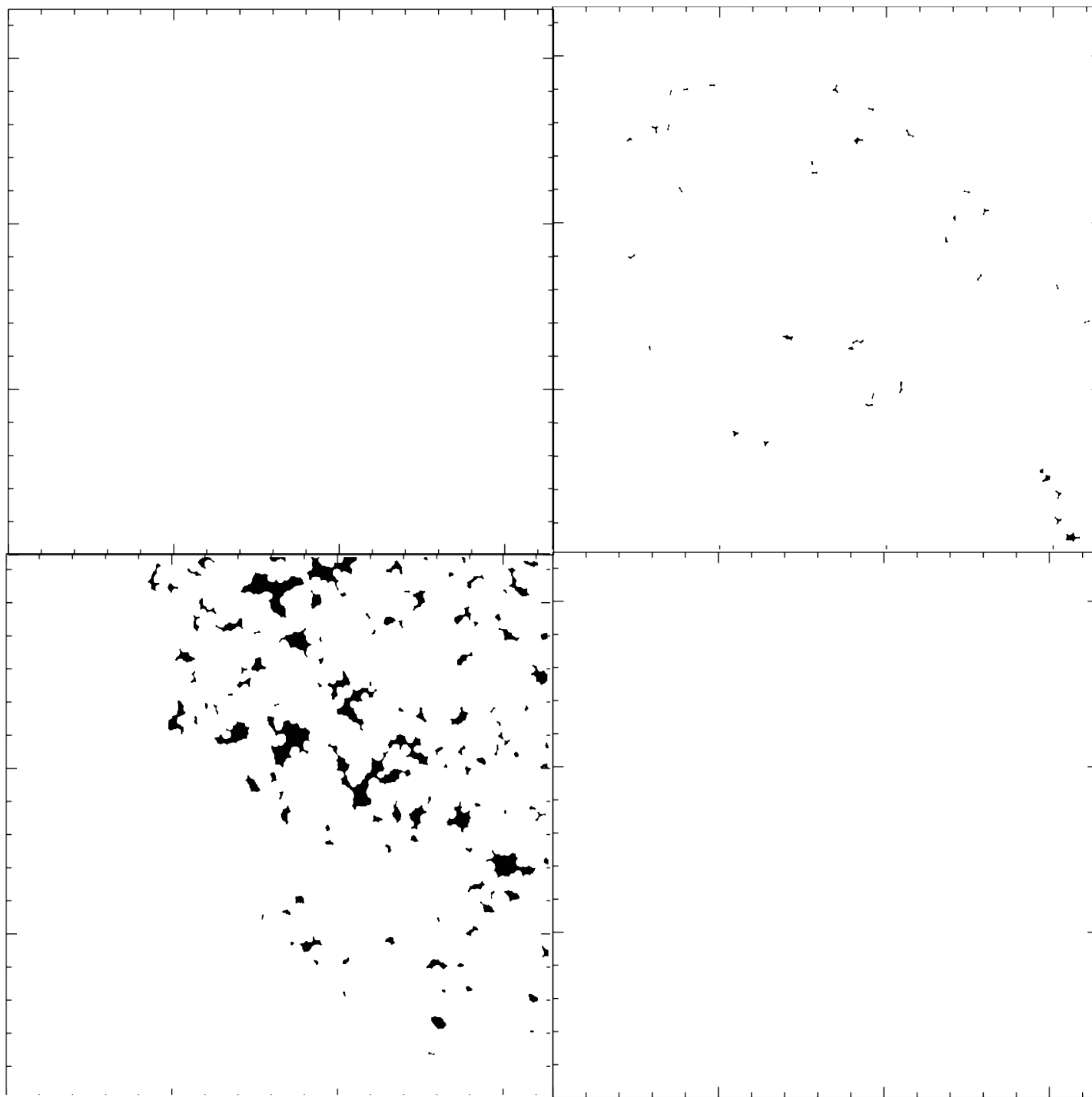


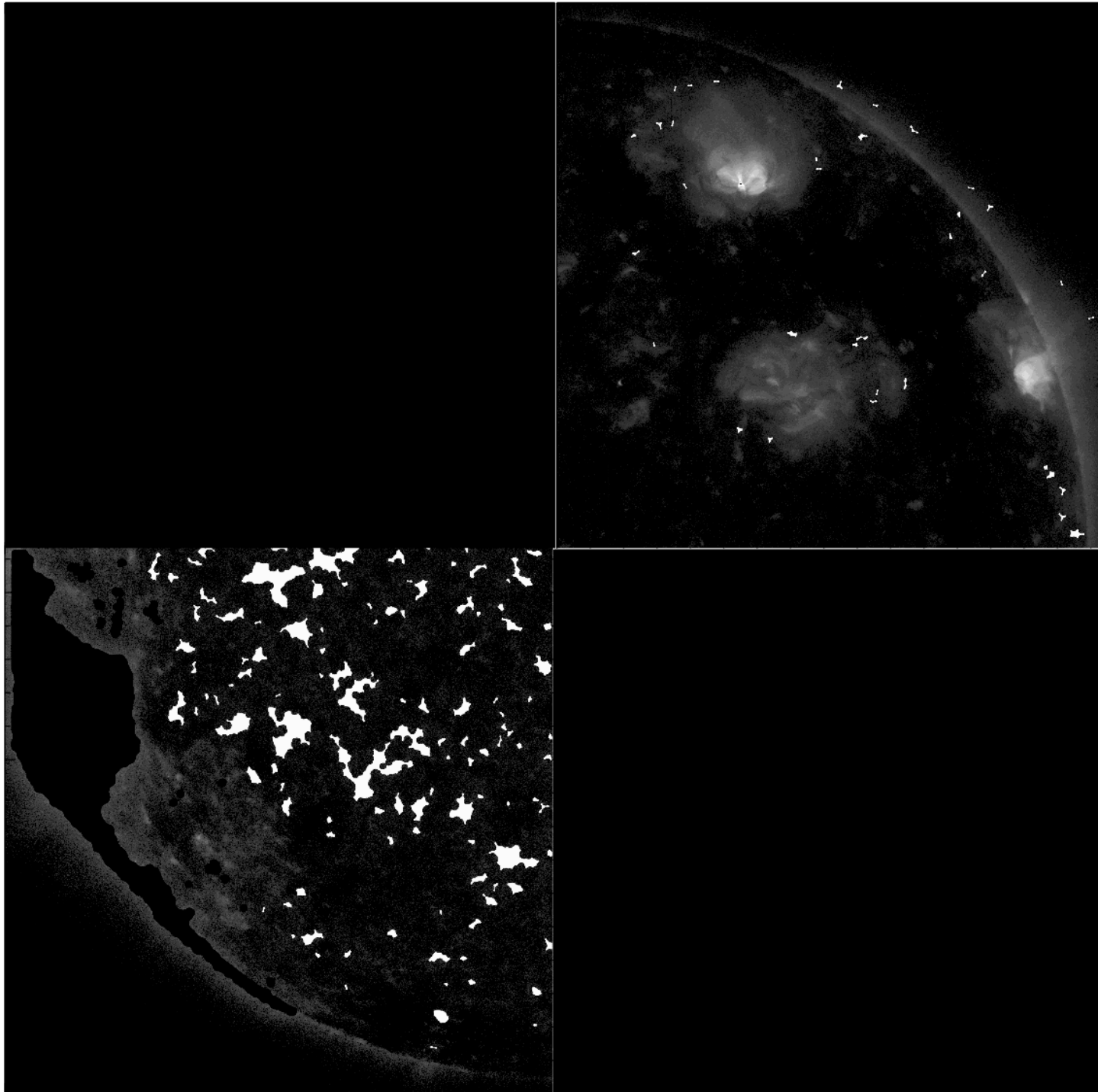
**335 Å - SDO AIA**











# RESULTS

