

Measurements of the altitudes of solar filaments

Guy Artzner

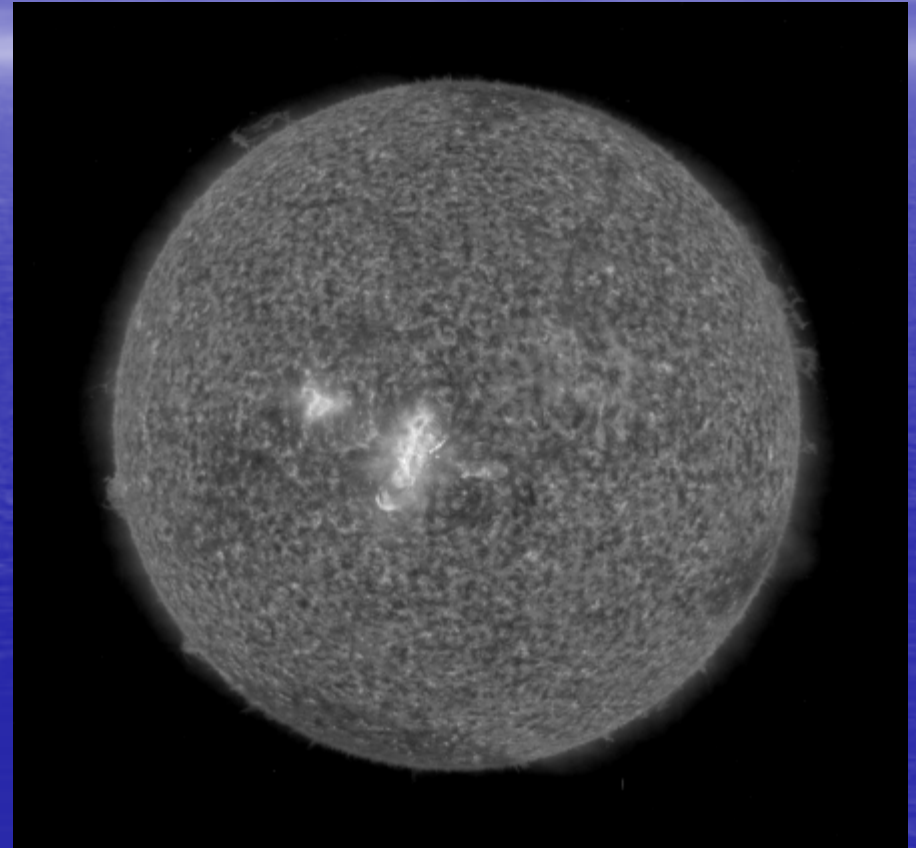
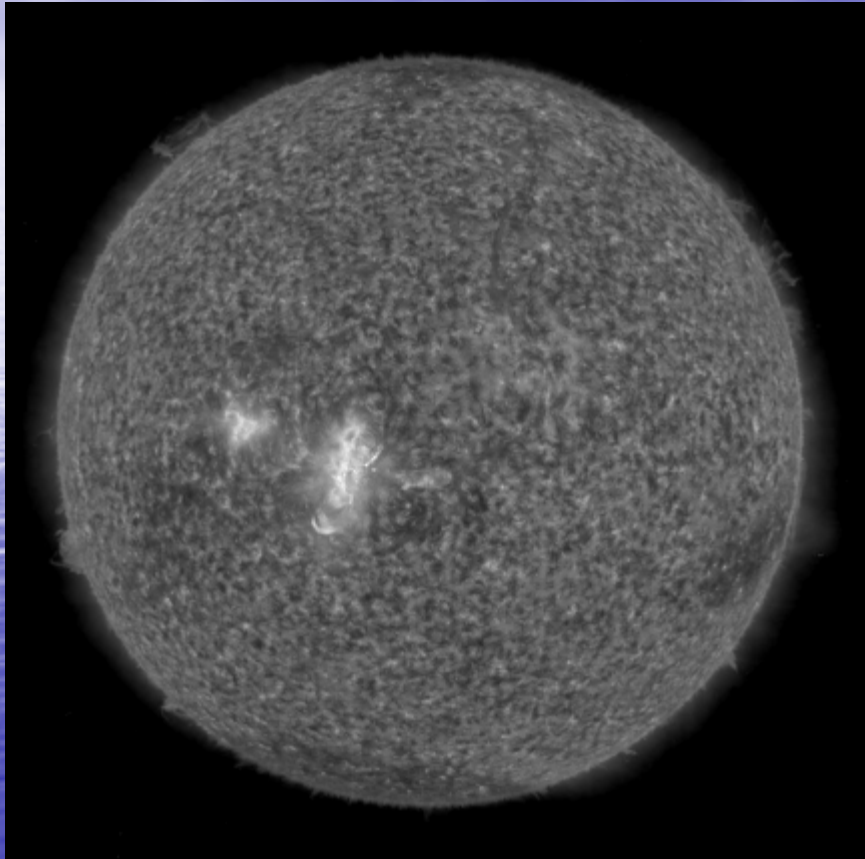
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Orsay

Guy.artzner@m4x.org

ftp://ftp.ias.u-psud.fr/gartzner/ftp_projet/Secchi/

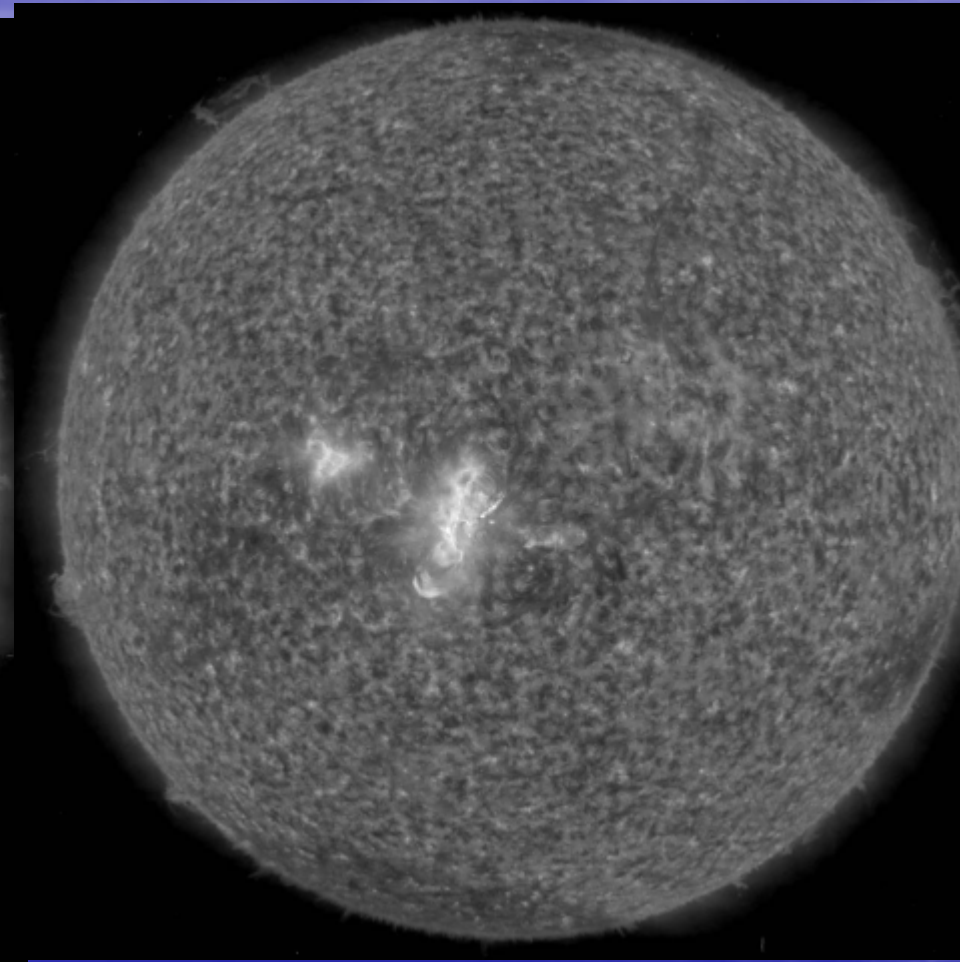
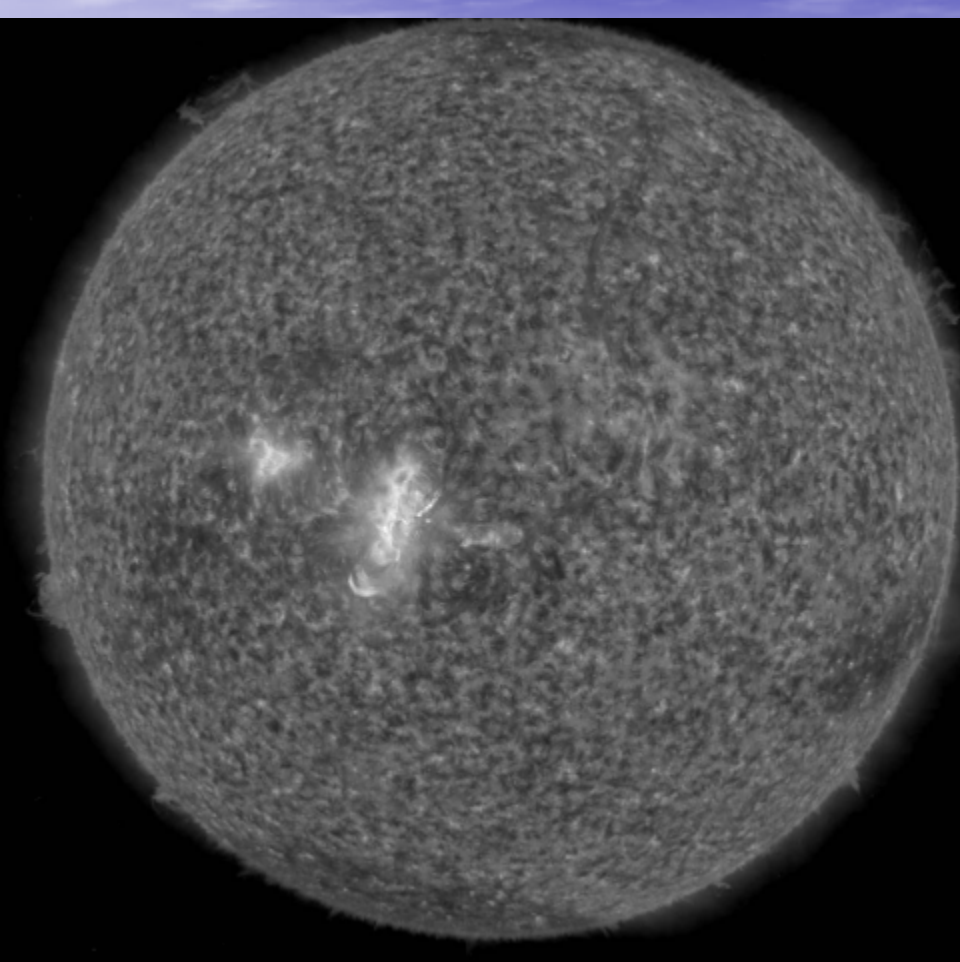
may 1st ,2007 03h 51m

no adjustments: **strenuous crossed viewing**



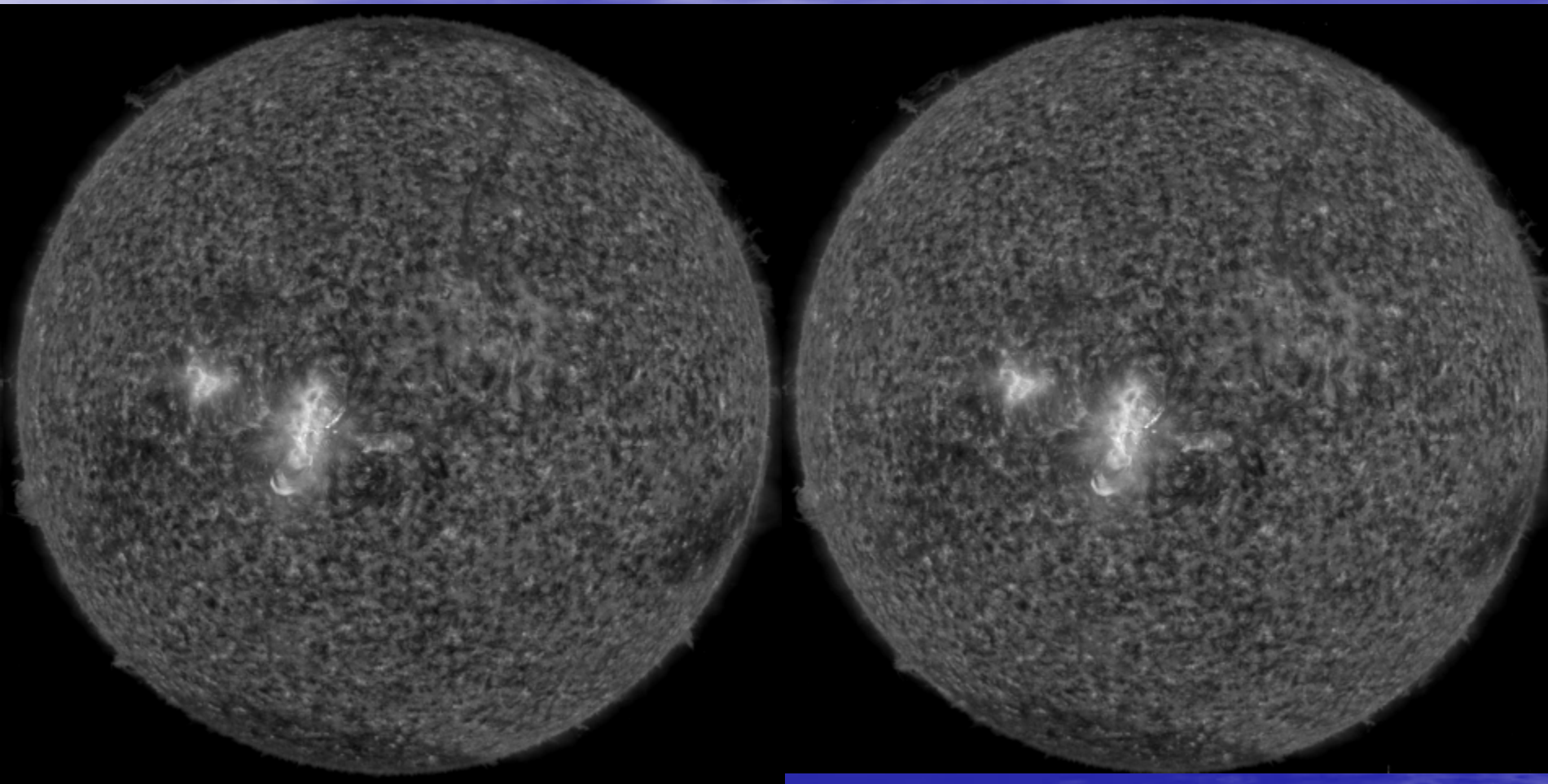
may 1st ,2007 03h 51m

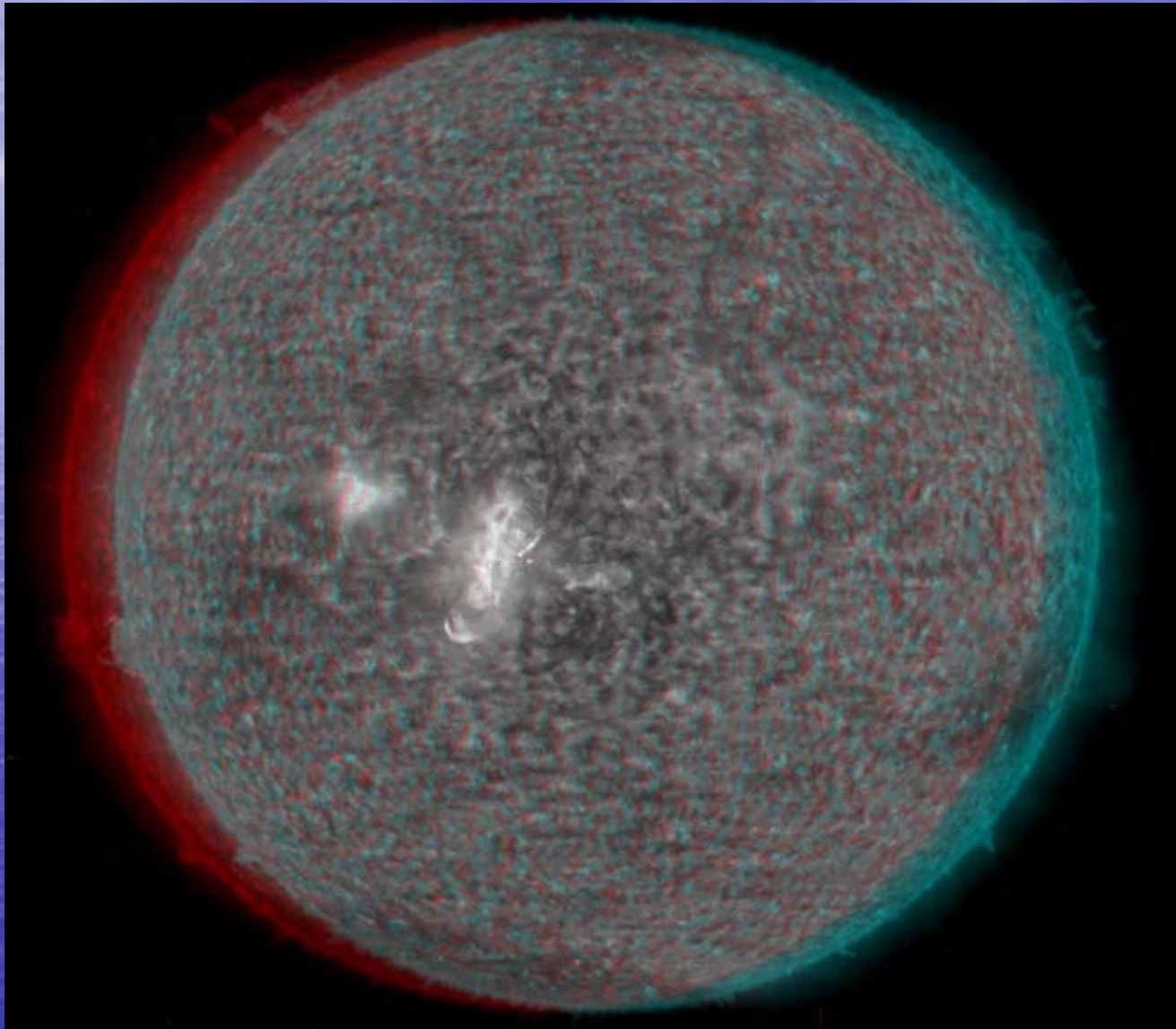
crossed views: **Visually correct adjustment with StereoPhotoMaker procedure**



may 1st ,2007 03h 51m

Visually correct adjustment with FITS parameters





Numerical projection method

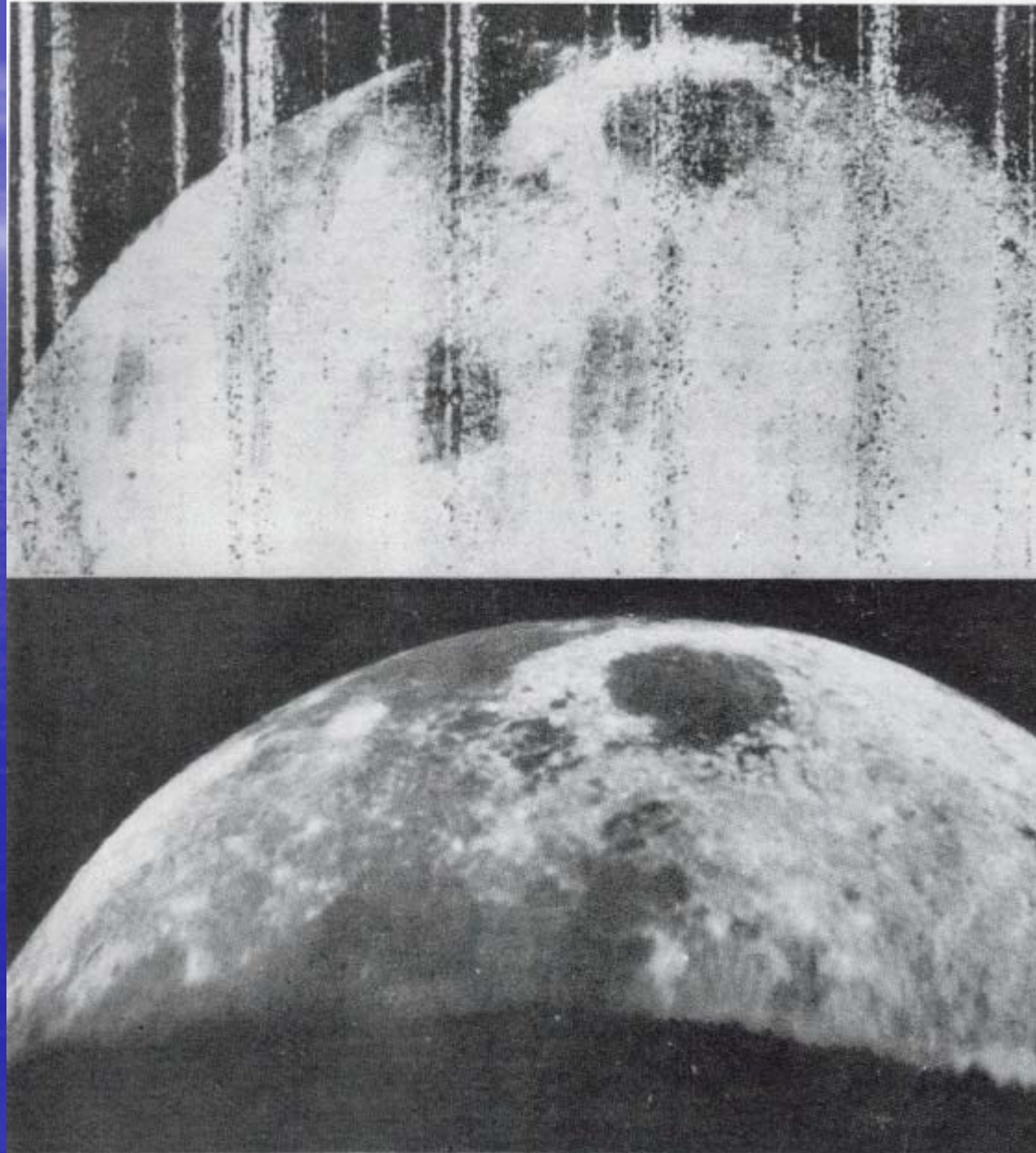
Every point P_a of a (right) view from STEREO-A has two integer coordinates ia and ja . This point is colored in blue, according to the corresponding intensity. We firstly compute the cartesian coordinates (x,y,z) of the physical point M at the intersection of the line of sight with the sphere of radius R centered on the Sun's center.

We then compute the image coordinates ib and jb of the image point P_b corresponding to the physical point M in the (left) STEREO-B image. The point P_a is colored in red, according to the intensity actually measured at the location P_b in the STEREO-B image.

LUNIK III

Histoire de deux planètes
Gérard P. Kuiper

L'Astronomie, pp. 322-328, nov. 1962



STEREO Secchi EUVI 304A

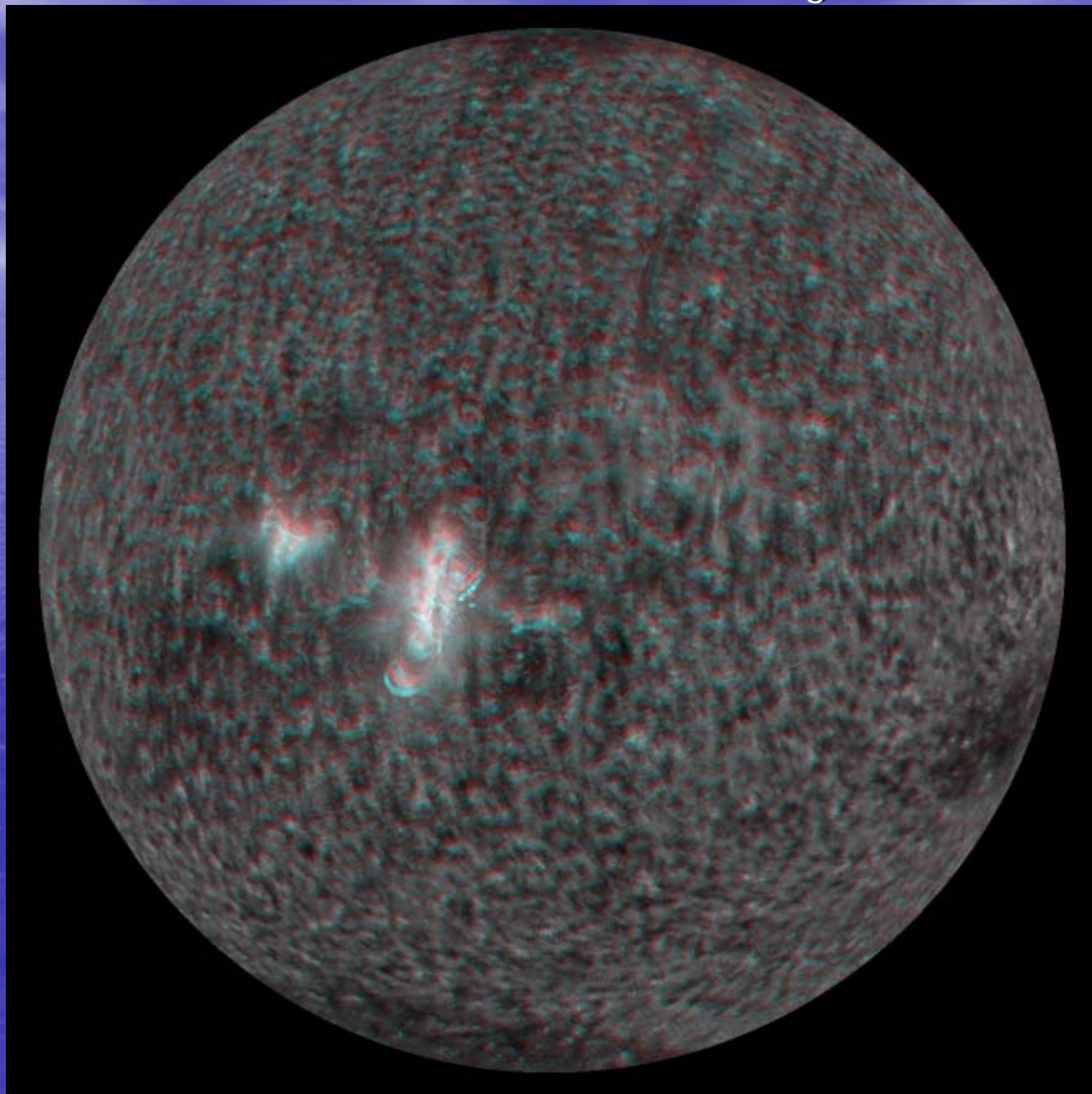
may 1st ,2007 03h 51m

Small basis

Large basis

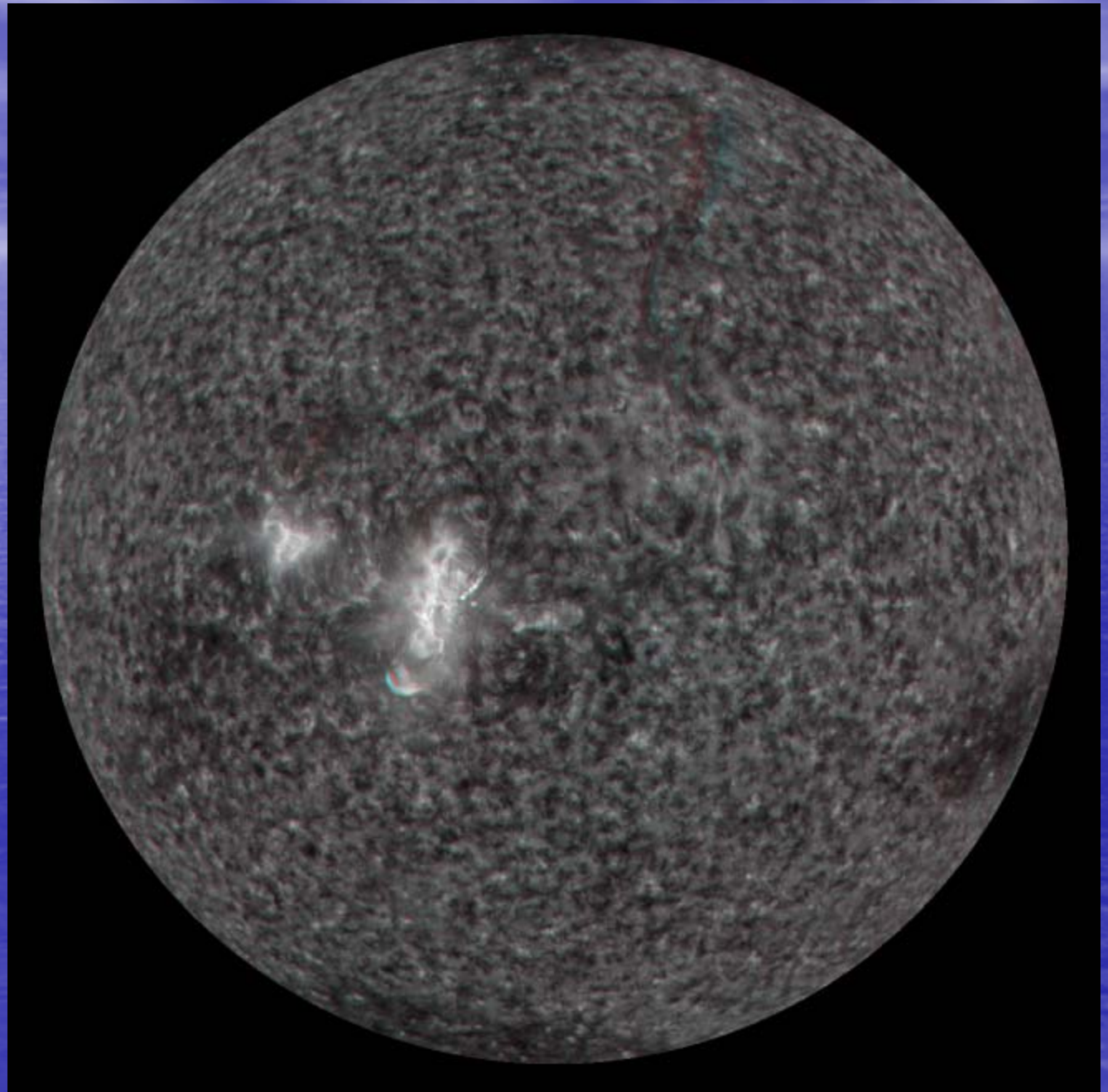
STEREO-B view
projected on the
STEREO-A view

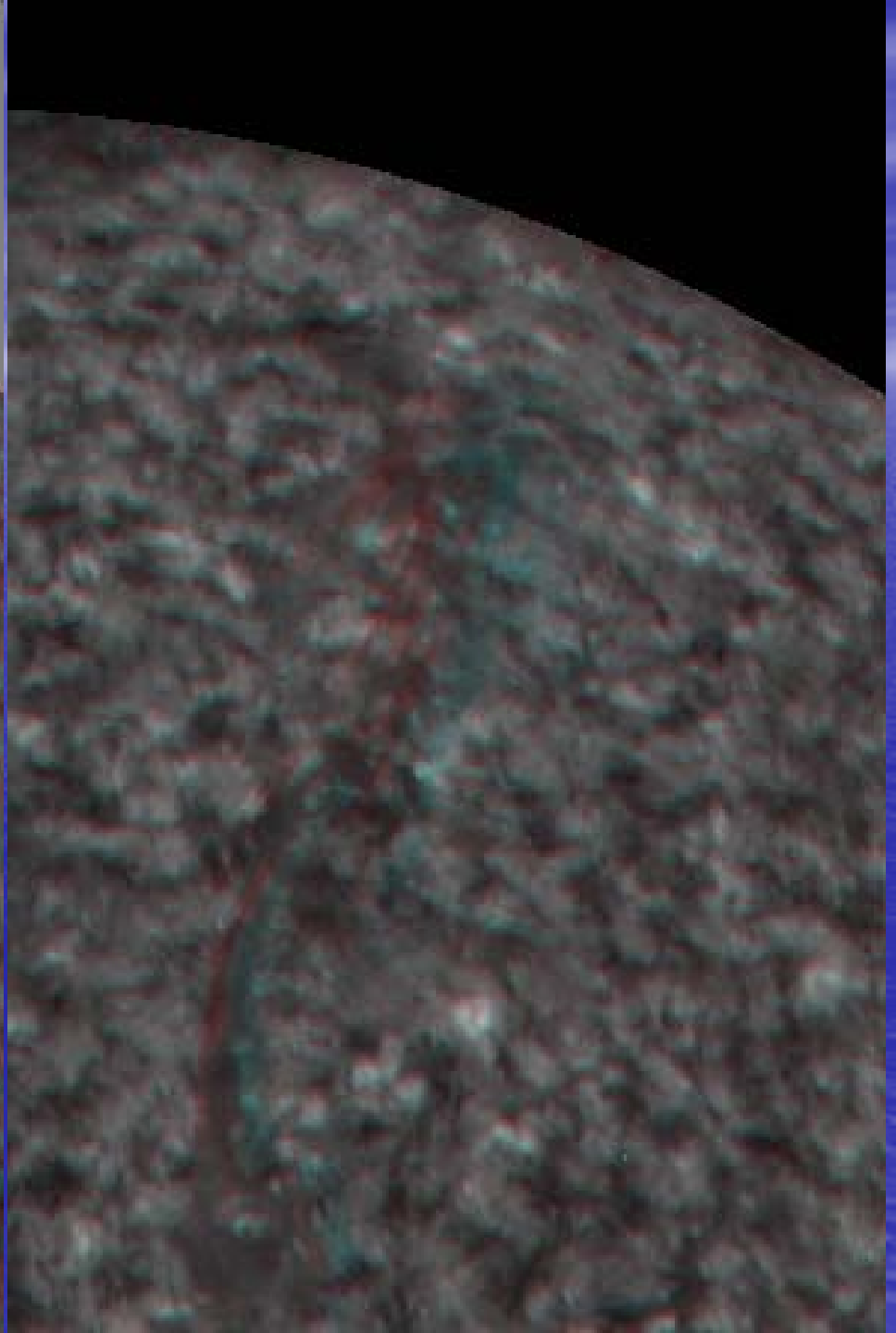
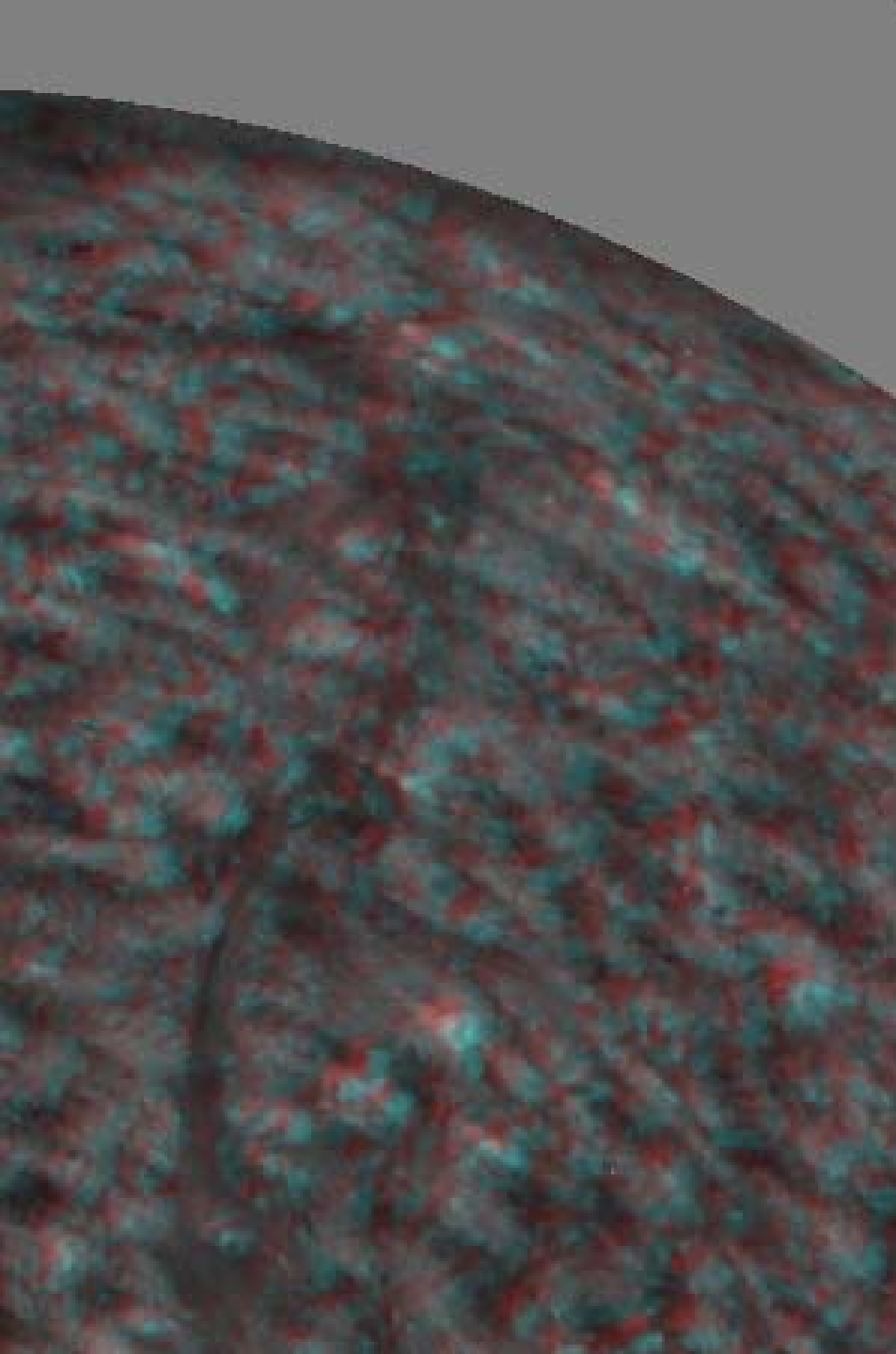
according to the
FITS headers

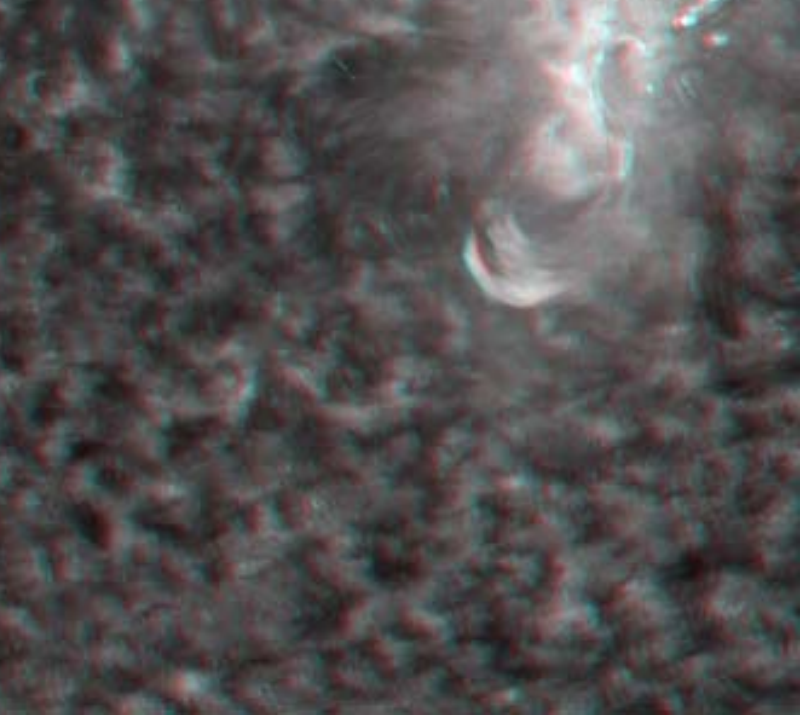
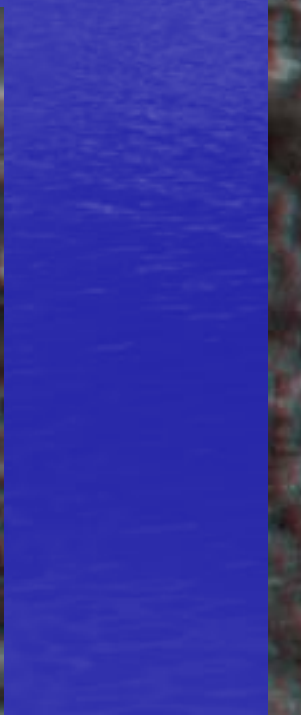
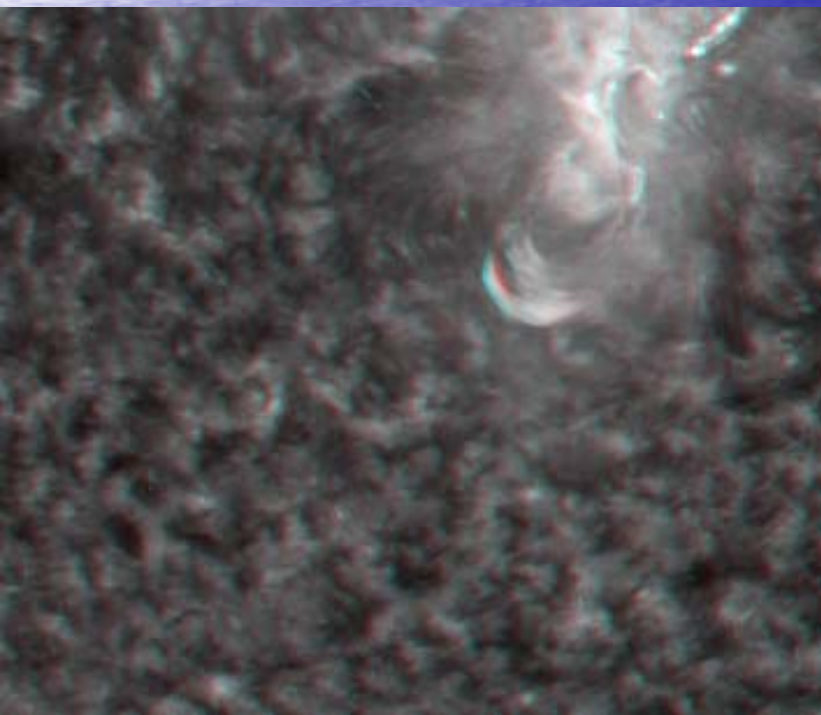
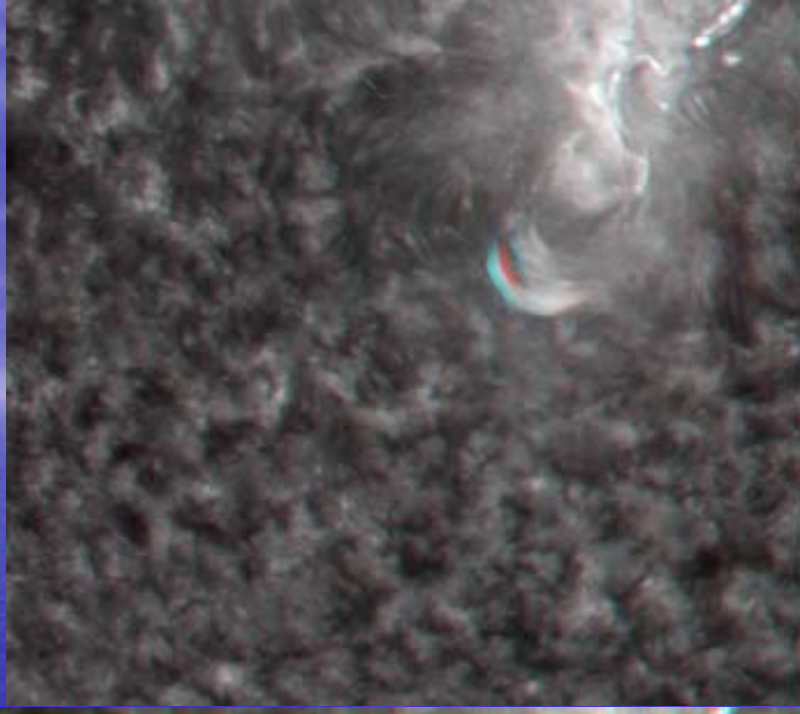
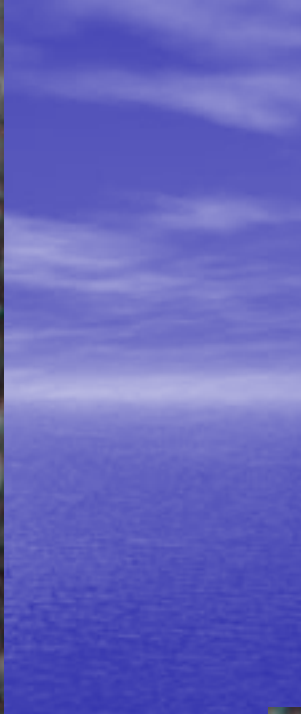
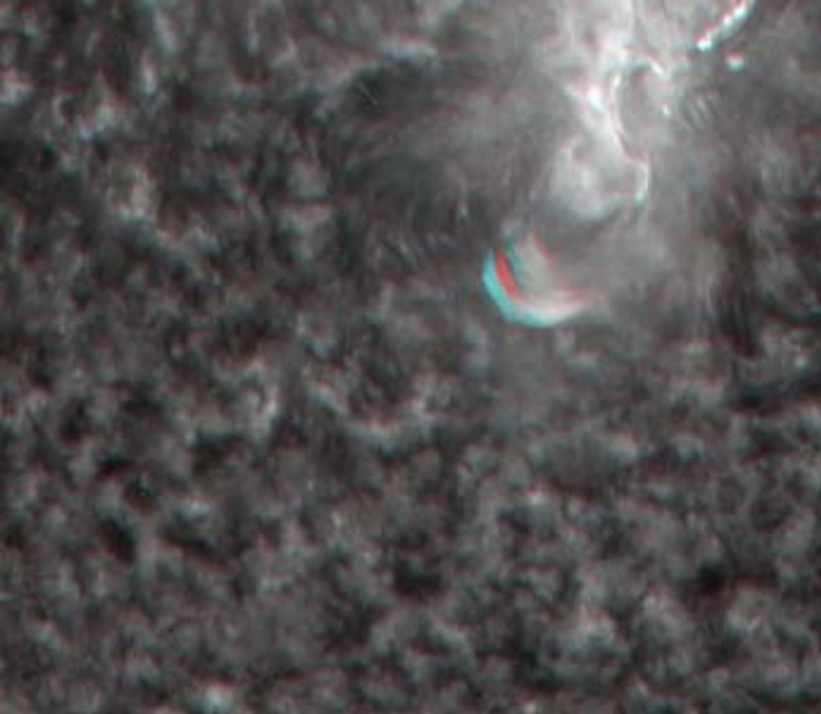


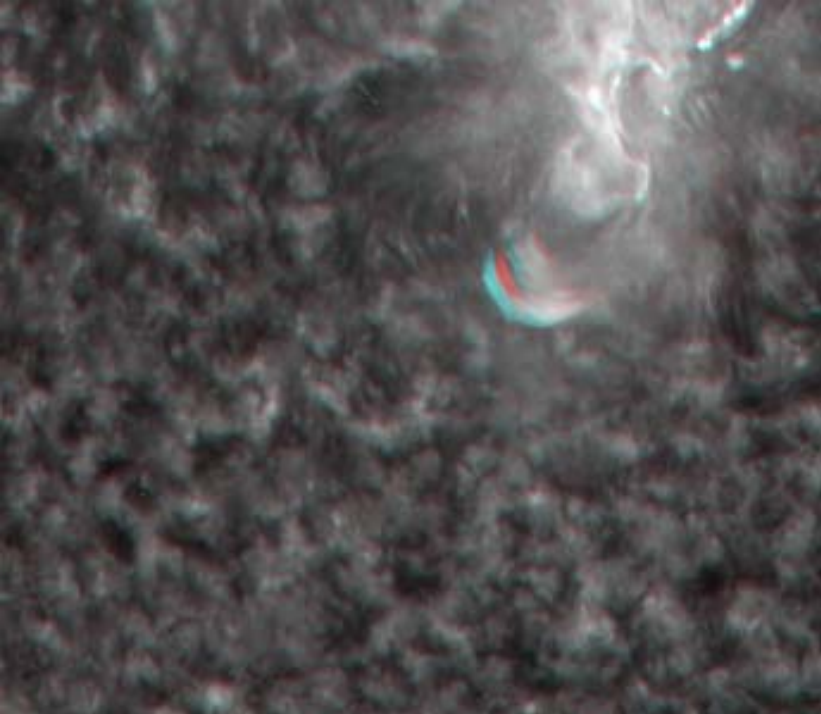
STEREO-B view
projected on the
STEREO-A view

after an automatic
adjustment of
ONE angular
parameter

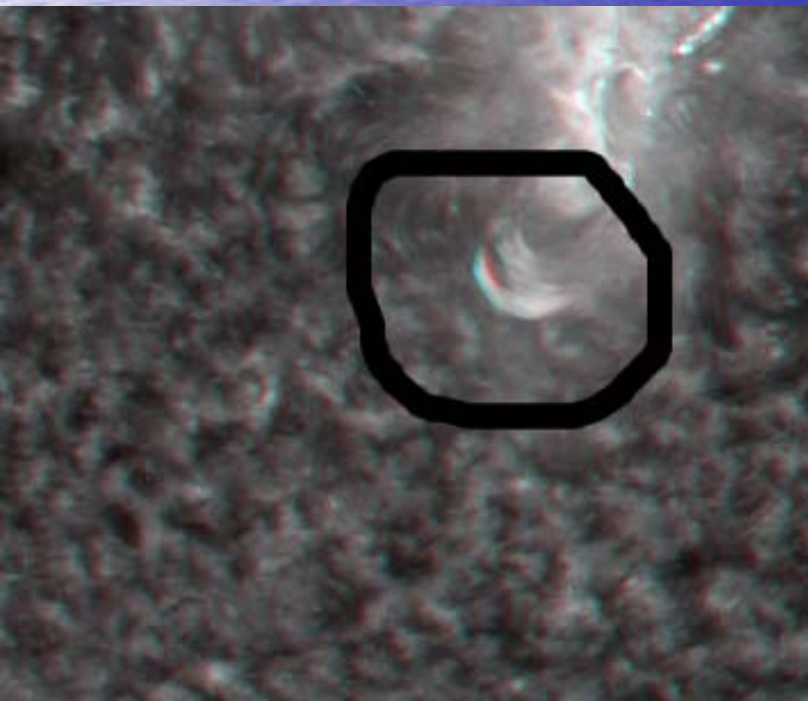
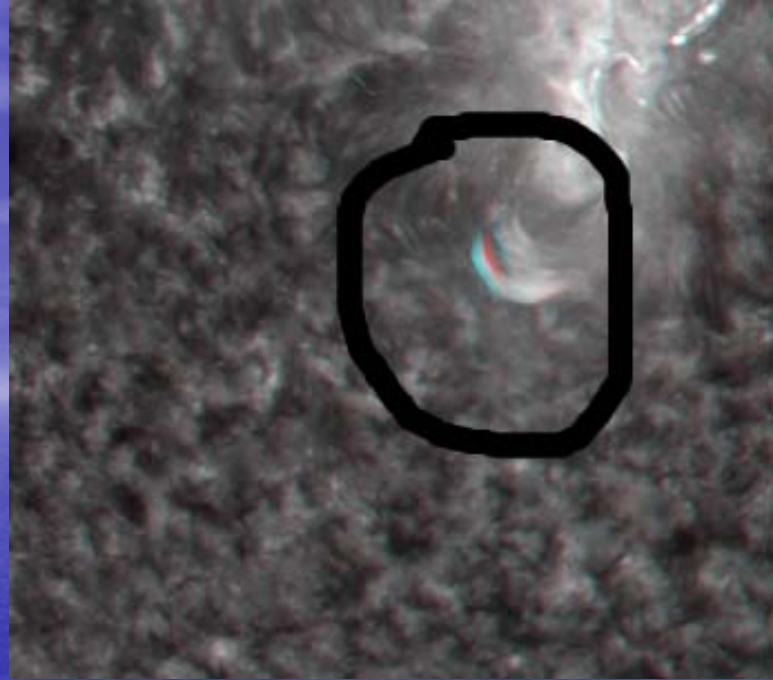




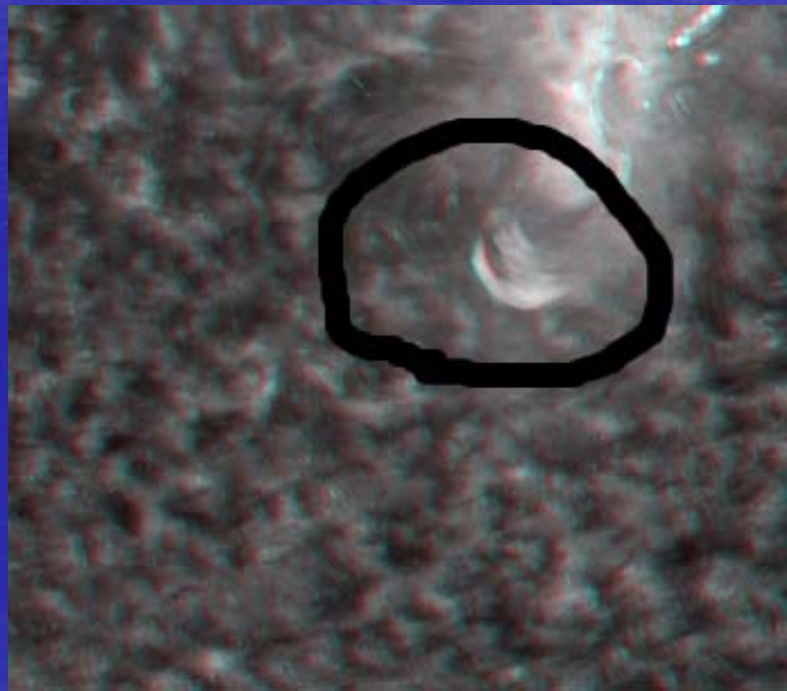




700 Mm 710Mm



720Mm 730Mm

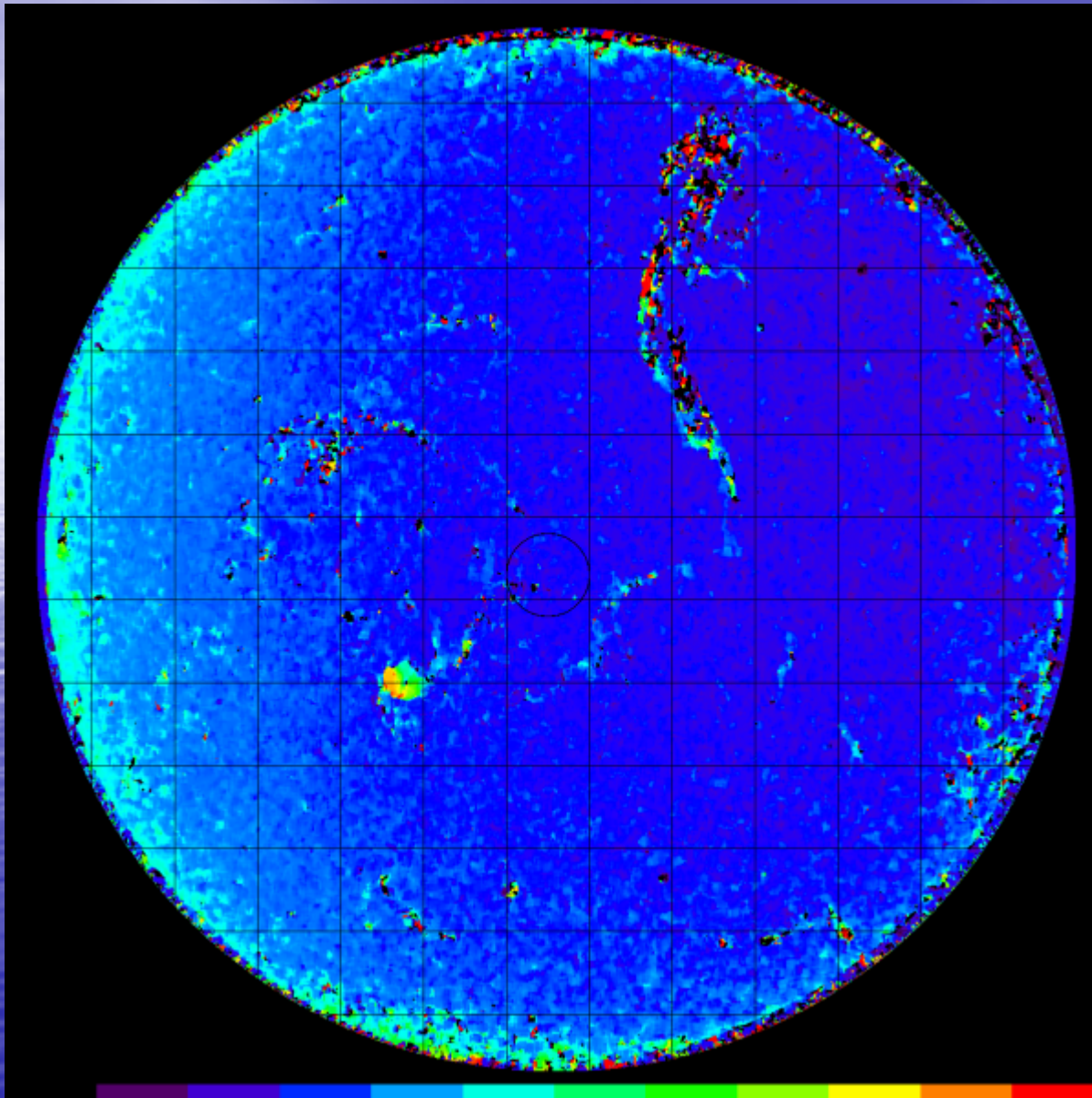


STEREO Secchi EUVI 304A

Small basis
may 1st ,2007 03h 51m

Large basis

Medicis correlator



Altitude of solar filaments

Guy Artzner

Meudon

April 22, 2008

STEREO Secchi EUVI 304A

Small basis

45.2° large basis

february 2 ,2008 00h06m 2008

600 seconds cadence

500 pixels parallax

STEREO Ahead EUVI 304



2008-02-02 00:06:15

STEREO Behind EUVI 304



2008-02-02 00:06:32

STEREO Secchi EUVI 304A

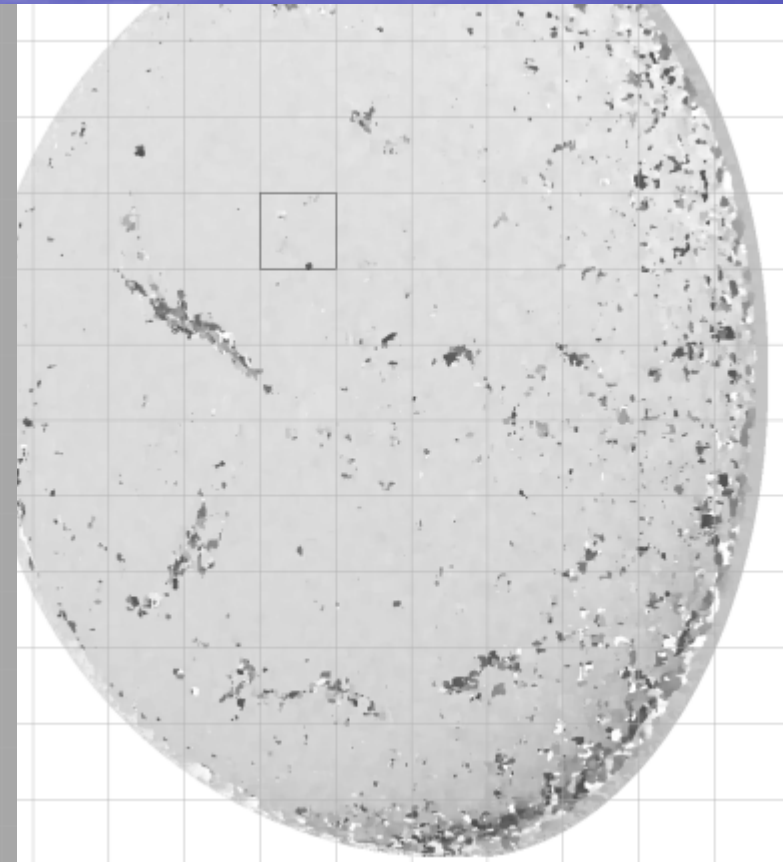
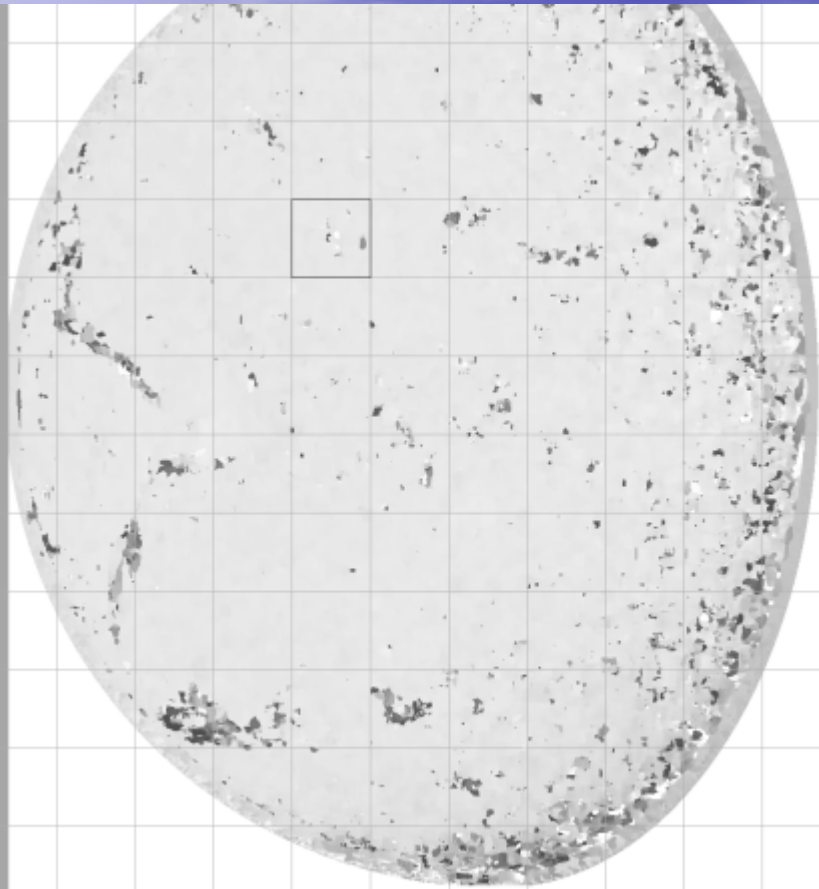
Small basis

45.2° large basis

february 2 , 19h56m - february 3, 05h06m 2008

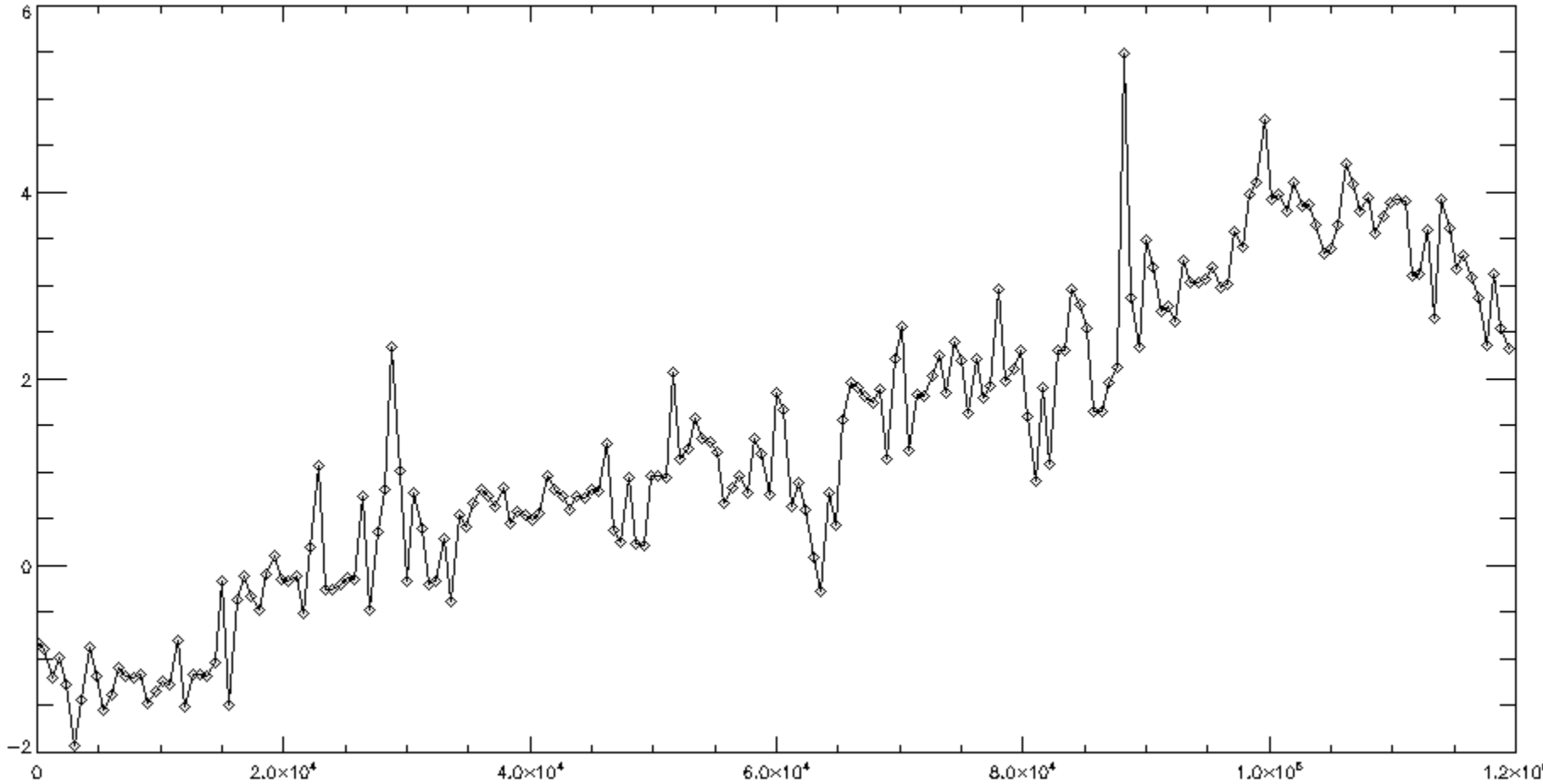
600 pixels parallax

Medicis correlator Reference Zone



X: time february 1 , 19h56m - february 3, 05h06m 2008 **Reference Zone**

Y: amount of the east-west component of the average vector between homologous points -2 to +6 pixels: 7 000 km solar asphericity OR residual defects of relative adjustments between A and B?



STEREO Secchi EUVI 304A

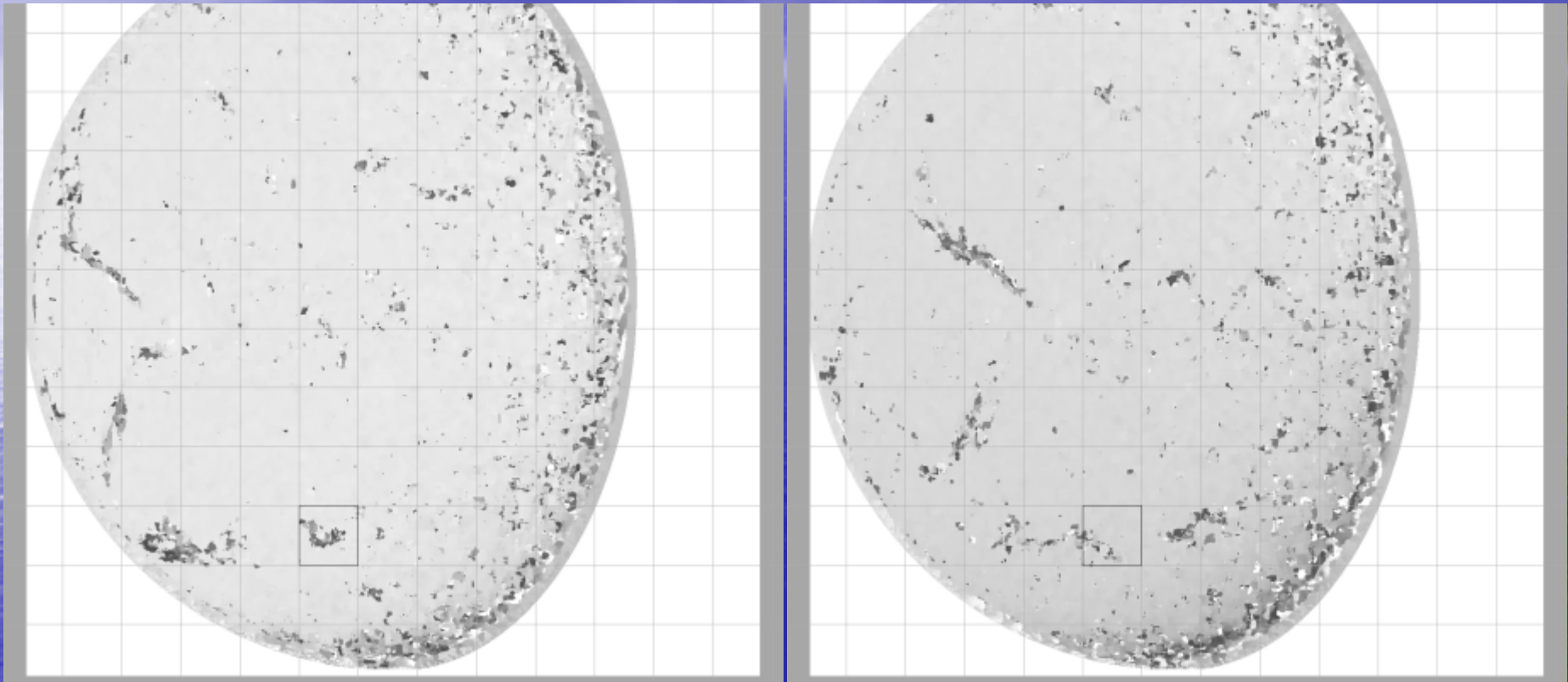
Small basis

45.2° large basis

february 2 , 19h56m - february 3, 05h06m 2008

600 pixels parallax

Medicis correlator Zone#1



correlator

X: time

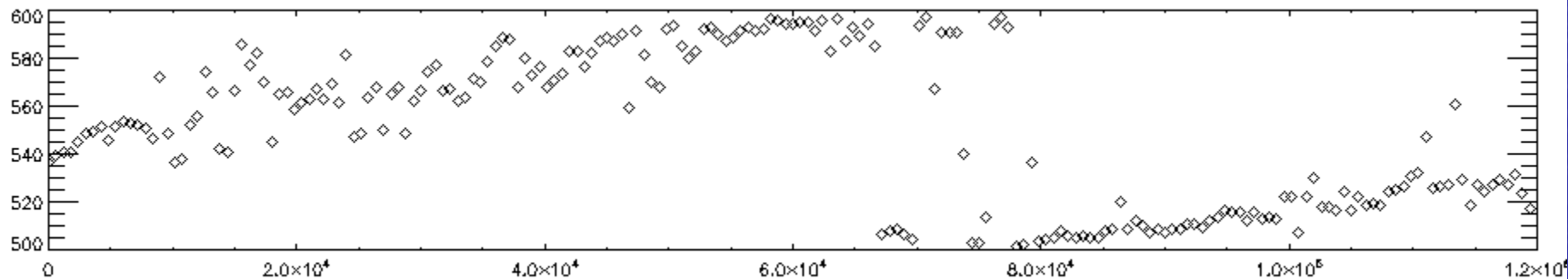
february 1 , 19h56m - february 3, 05h06m 2008

Zone#1

Y: east-west location of the barycenter of the largest connex region where the east-west component of the correlation vector is larger than 10 pixels

a) effect of the solar rotation

b) the «horizontal» size of the frame is too small



STEREO Secchi EUVI 304A

Small basis

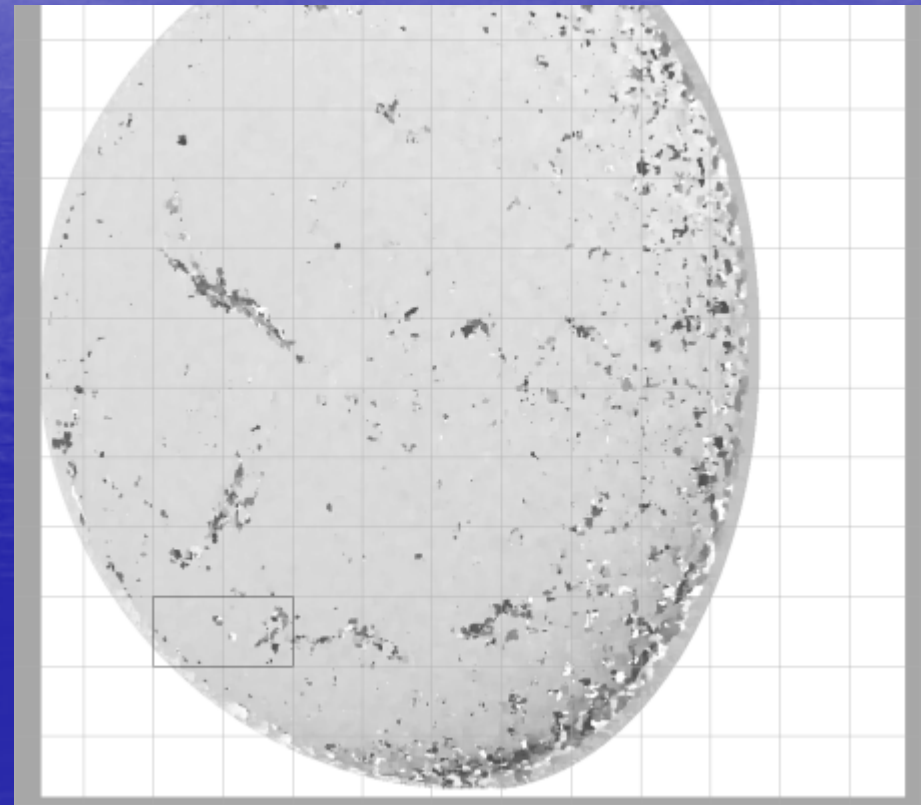
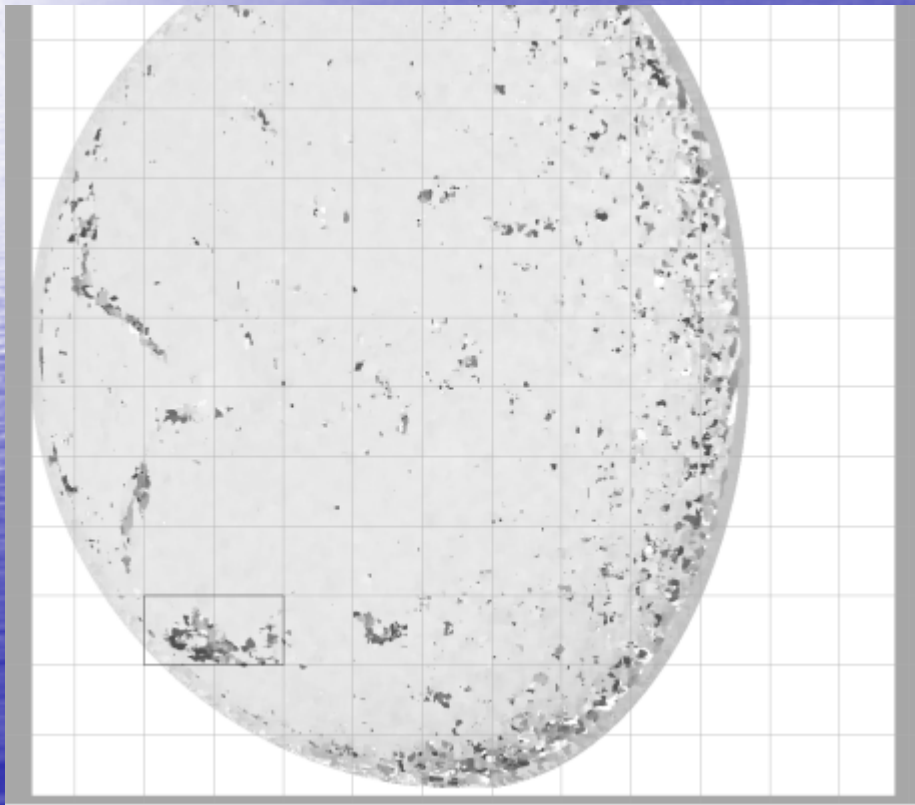
45.2° large

basis

february 2 , 19h56m - february 3, 05h06m 2008

500 pixels parallax

Medicis correlator Zone#2



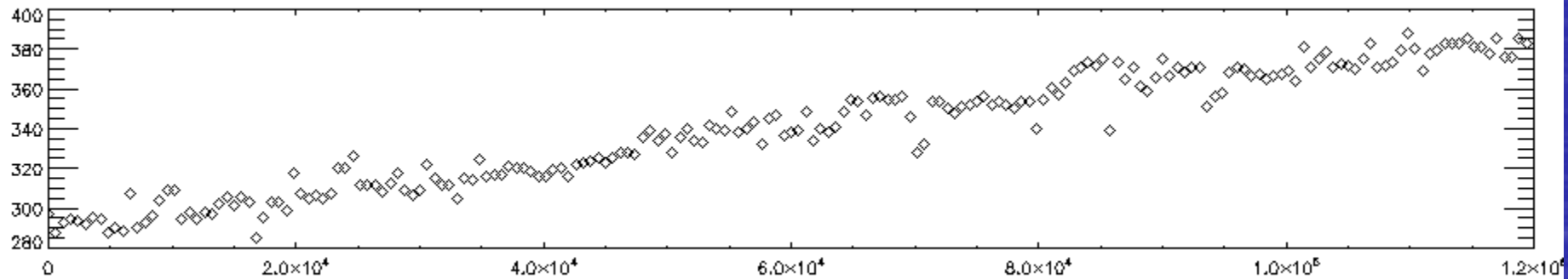
correlator

X: time february 1 , 19h56m - february 3, 05h06m 2008 **Zone#2**

Y: east-west location of the barycenter of the largest connex region where the east-west component of the correlation vector is larger than 10 pixels

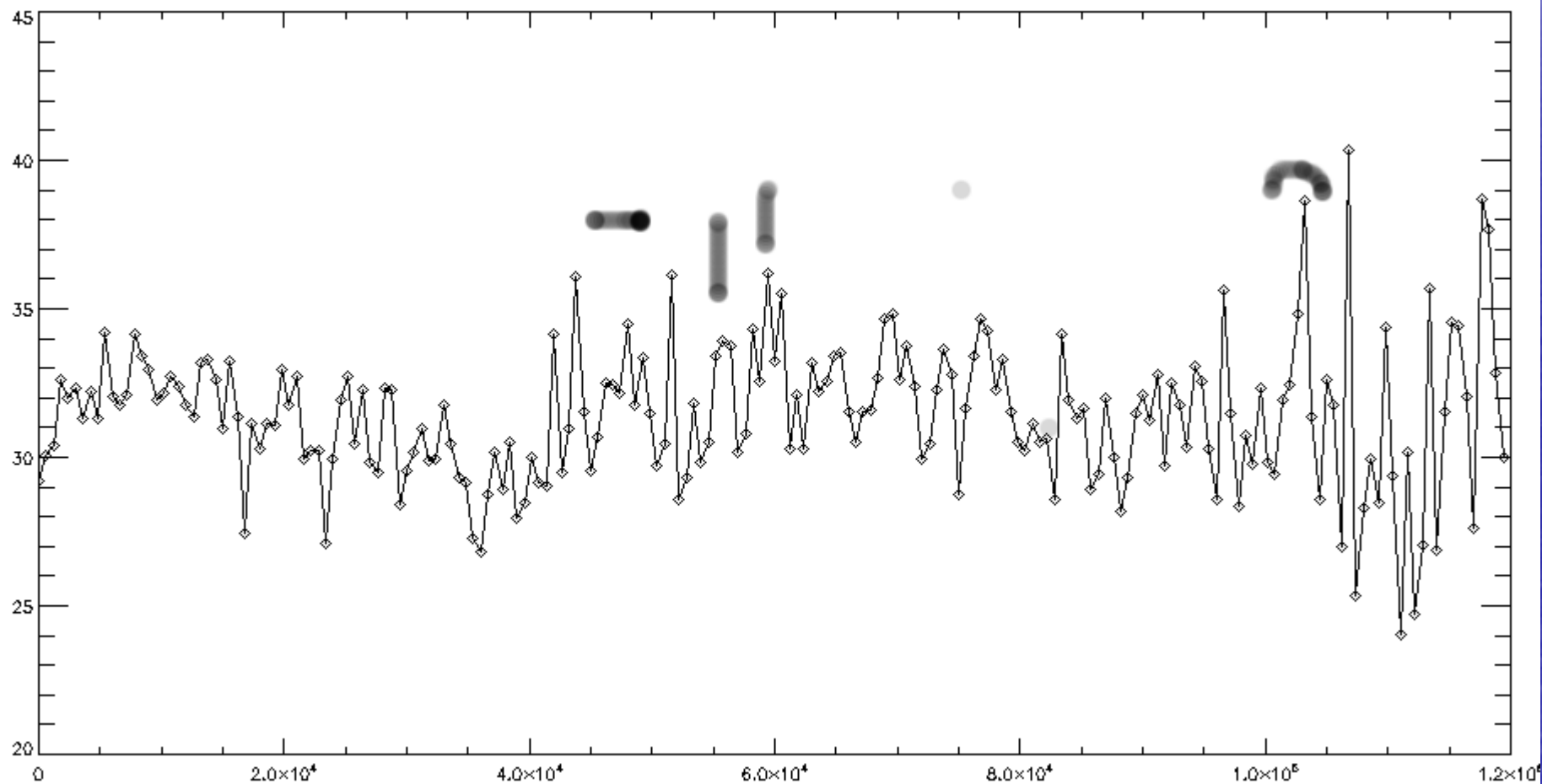
a) effect of the solar rotation

b) the «horizontal» size of the frame is large enough in order to follow a solar structure



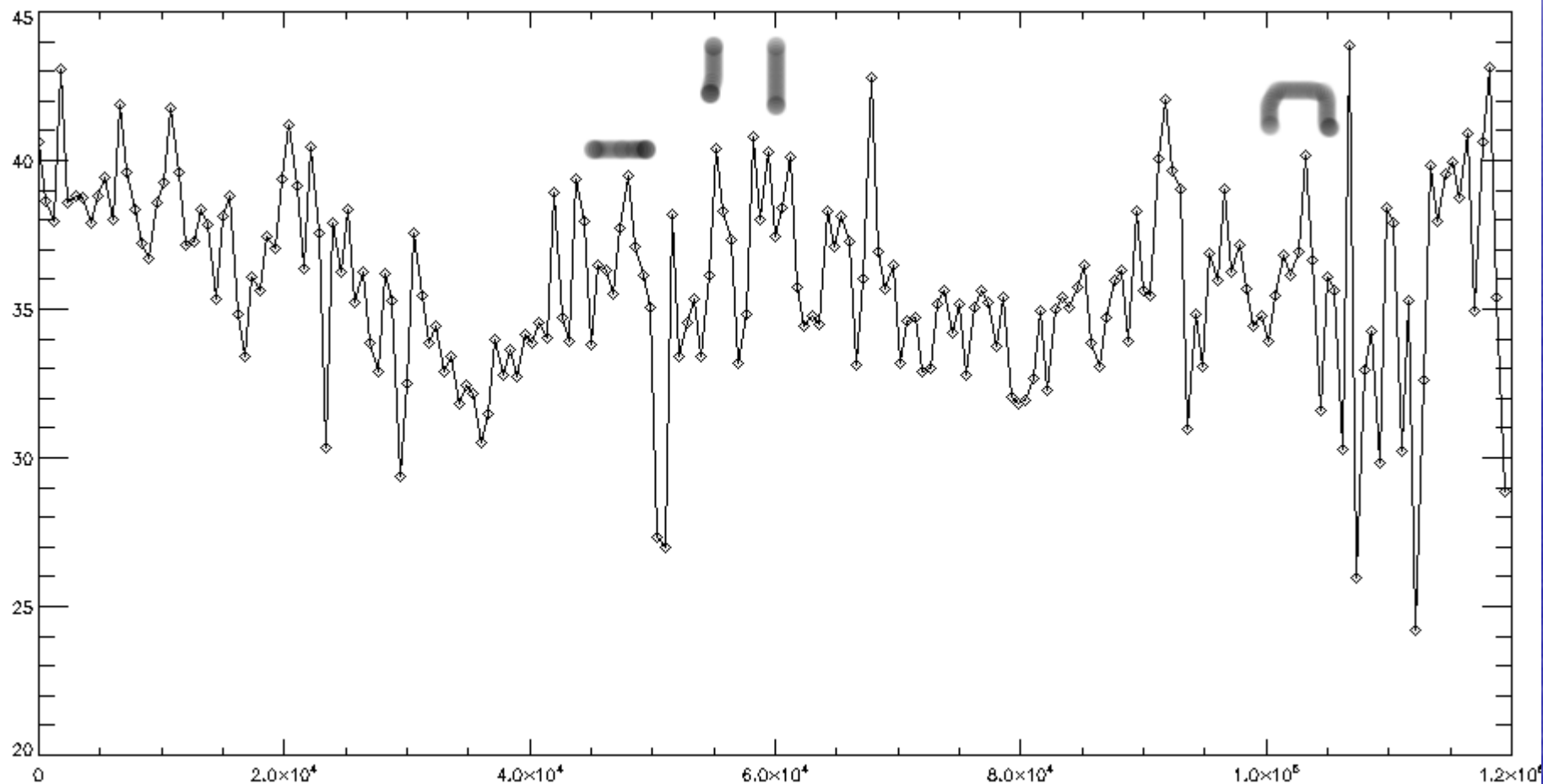
X: time february 1, 19h56m - february 3, 05h06m 2008 **Zone #2**

Y: amount of the east-west component of the average vector between homologous points over the largest connex region where this quantity is larger than 10 pixels



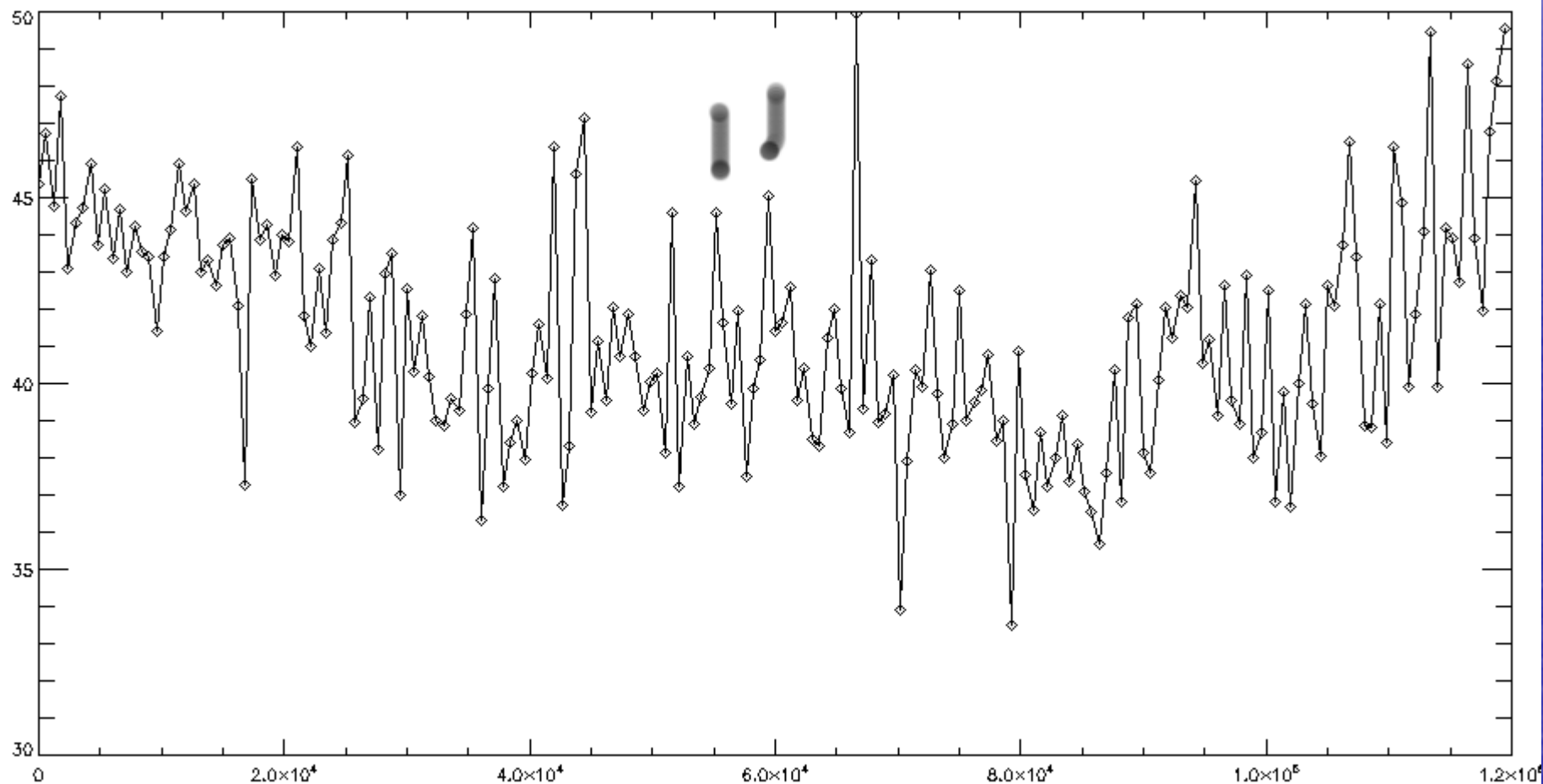
X: time february 1, 19h56m - february 3, 05h06m 2008 **Zone #2**

Y: amount of the east-west component of the average vector between homologous points over the largest connex region where this quantity is larger than 20 pixels



X: time february 1, 19h56m - february 3, 05h06m 2008 Zone #2

Y: amount of the east-west component of the average vector between homologous points over the largest connex region where this quantity is larger than 30 pixels



For STEREO Secchi EUVI 304A images with a separation angle as high as 45° we produced:

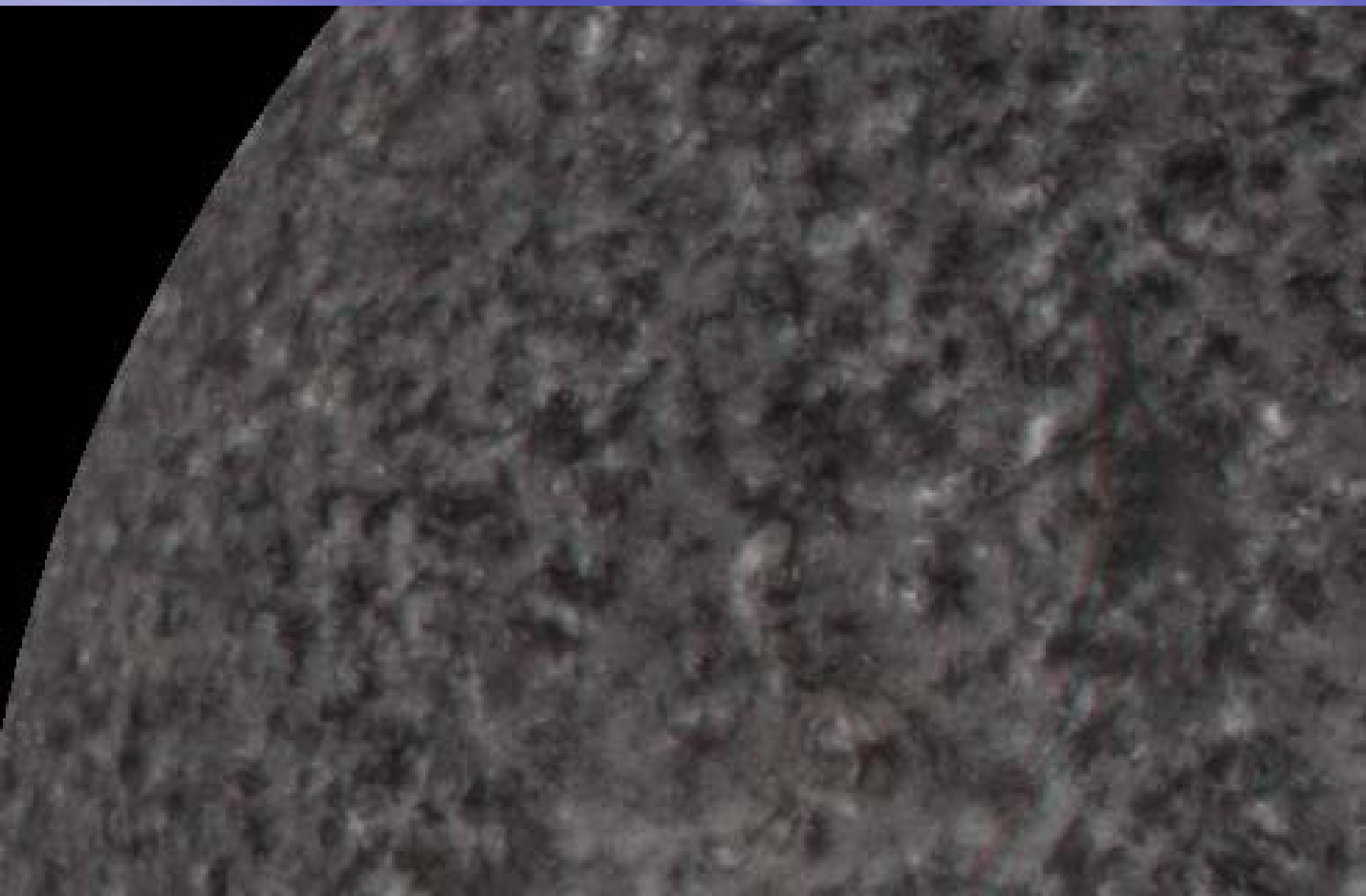
- _ anaglyphic views for the visual detection of high altitude solar structures without binocular vision;
- _ maps of a quantity related to the altitude of structures.

_we further indicated how to calibrate this quantity into altitudes.

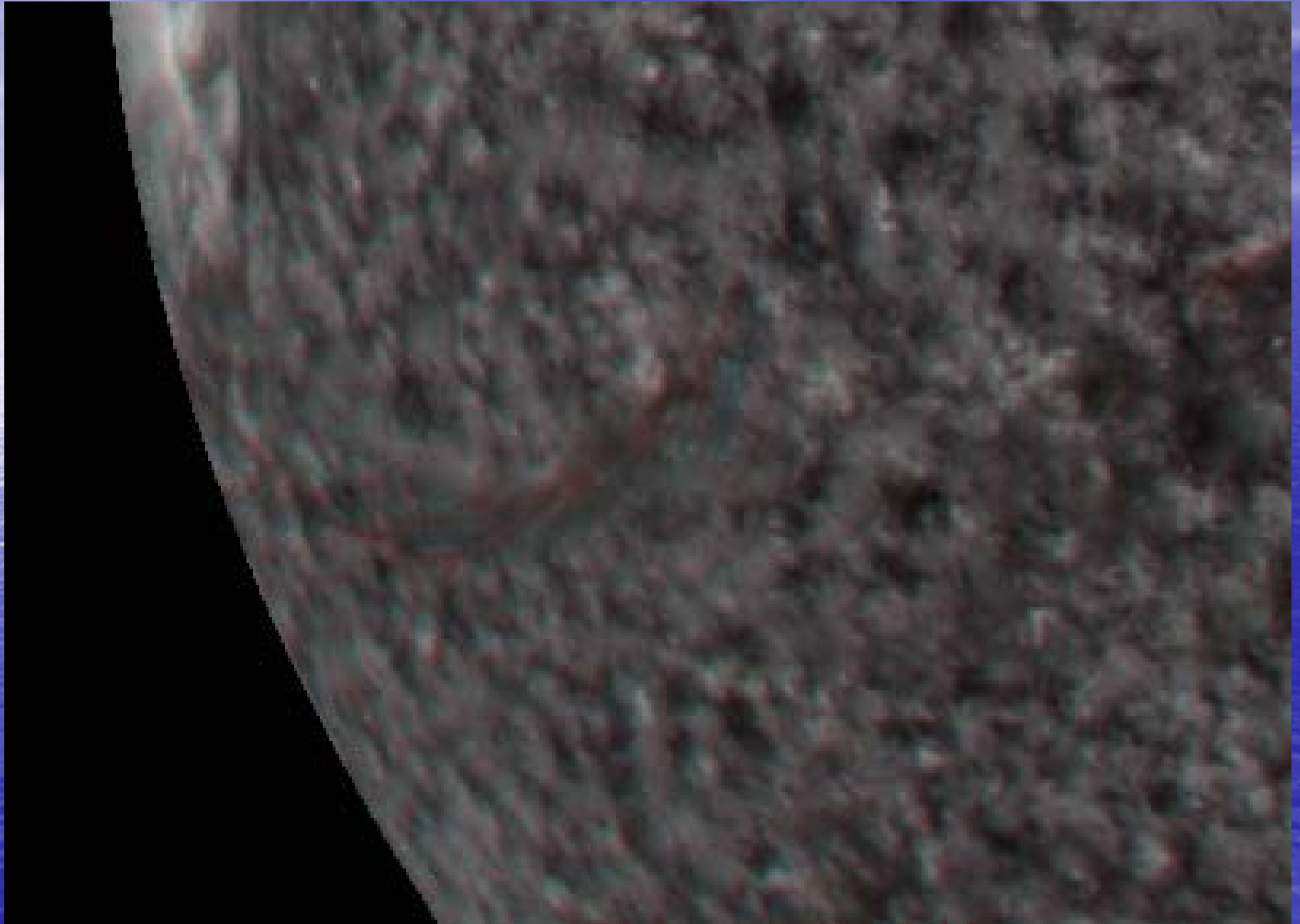
Further work:

- _ time studies of transient events;
- _ study of high cadence 304A observations;
- _ 171A, 195 and 284 observations;
- _ taking into account the epipolar relation.

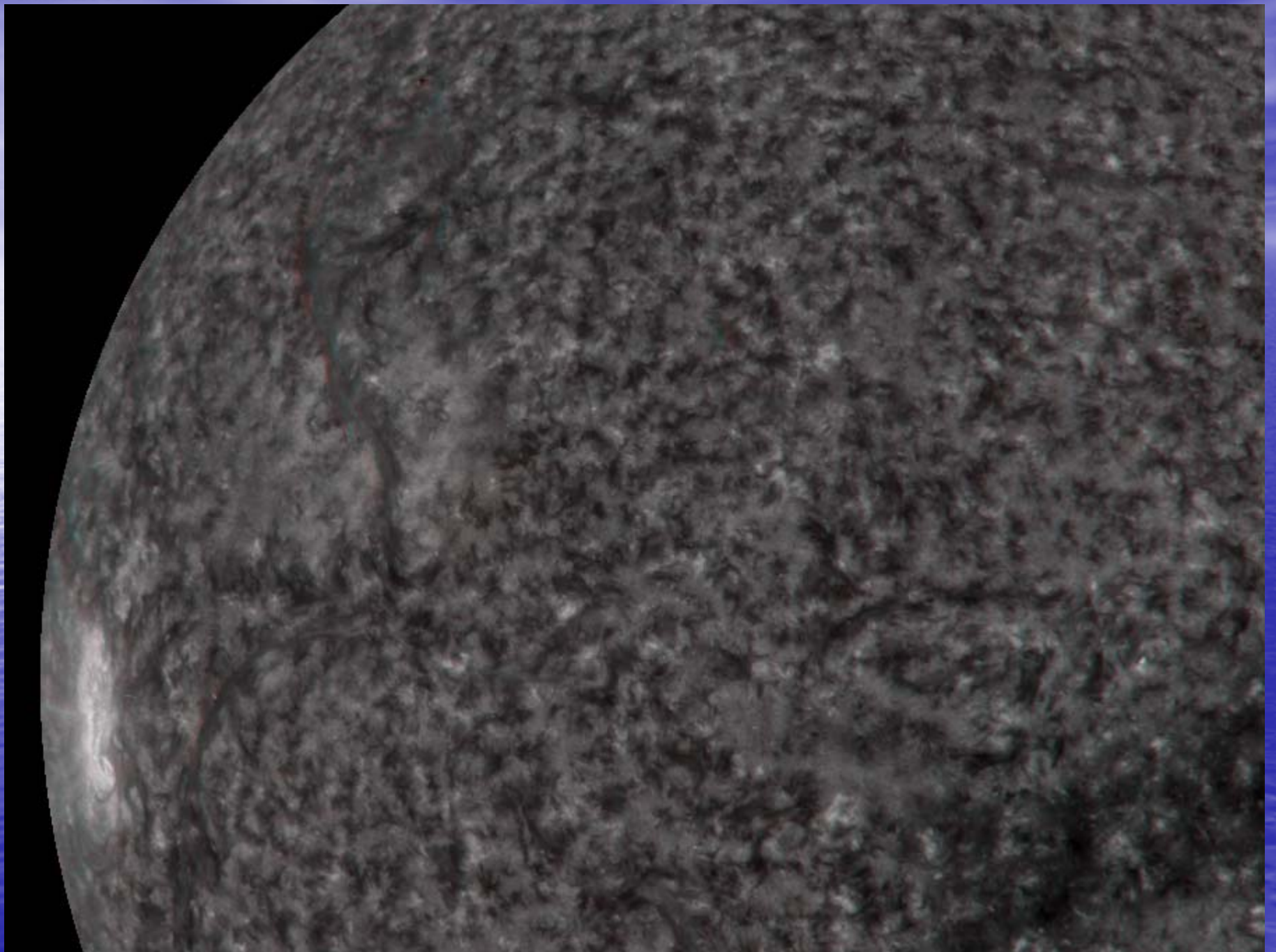
1 mars 2007



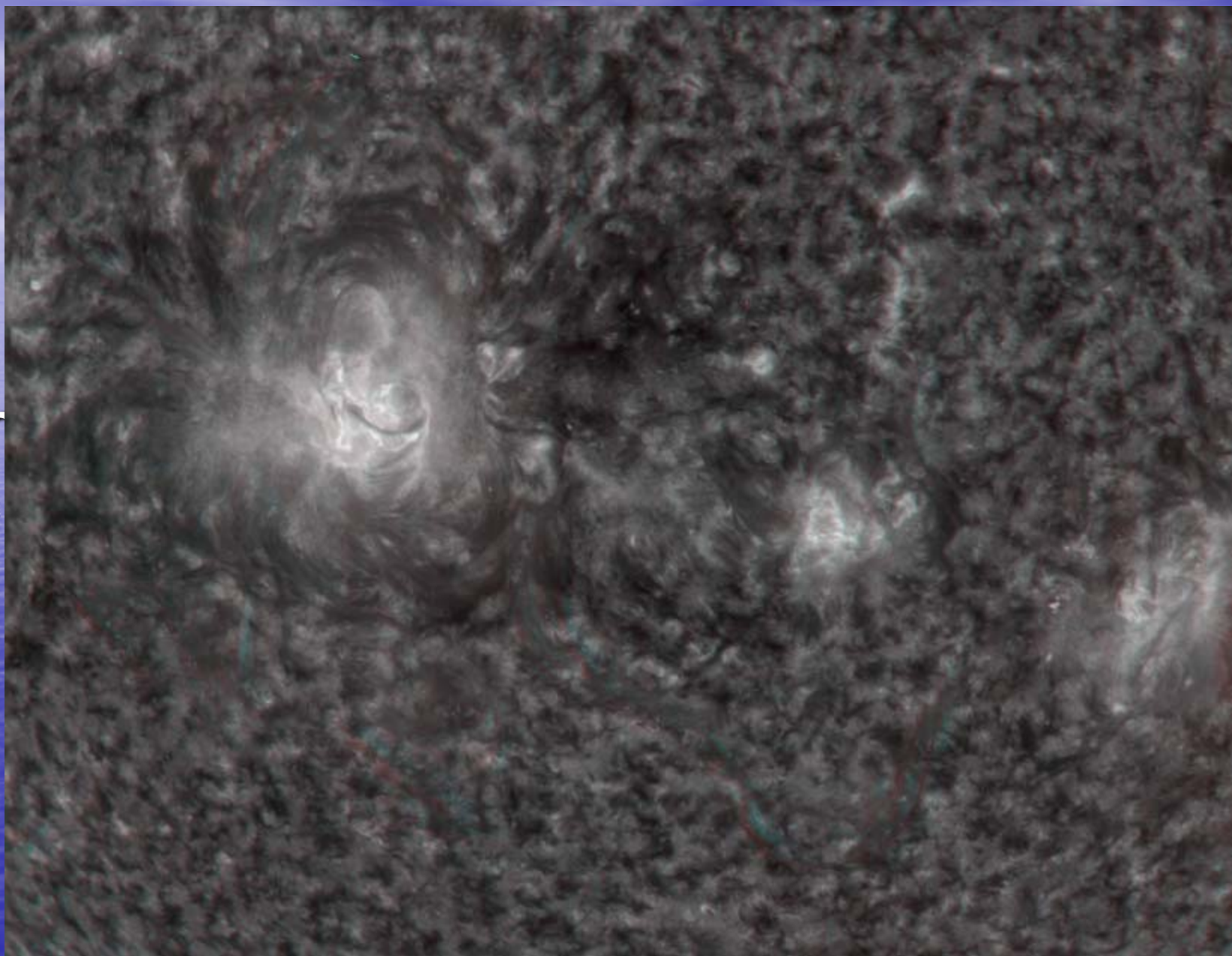
30 mai 2007



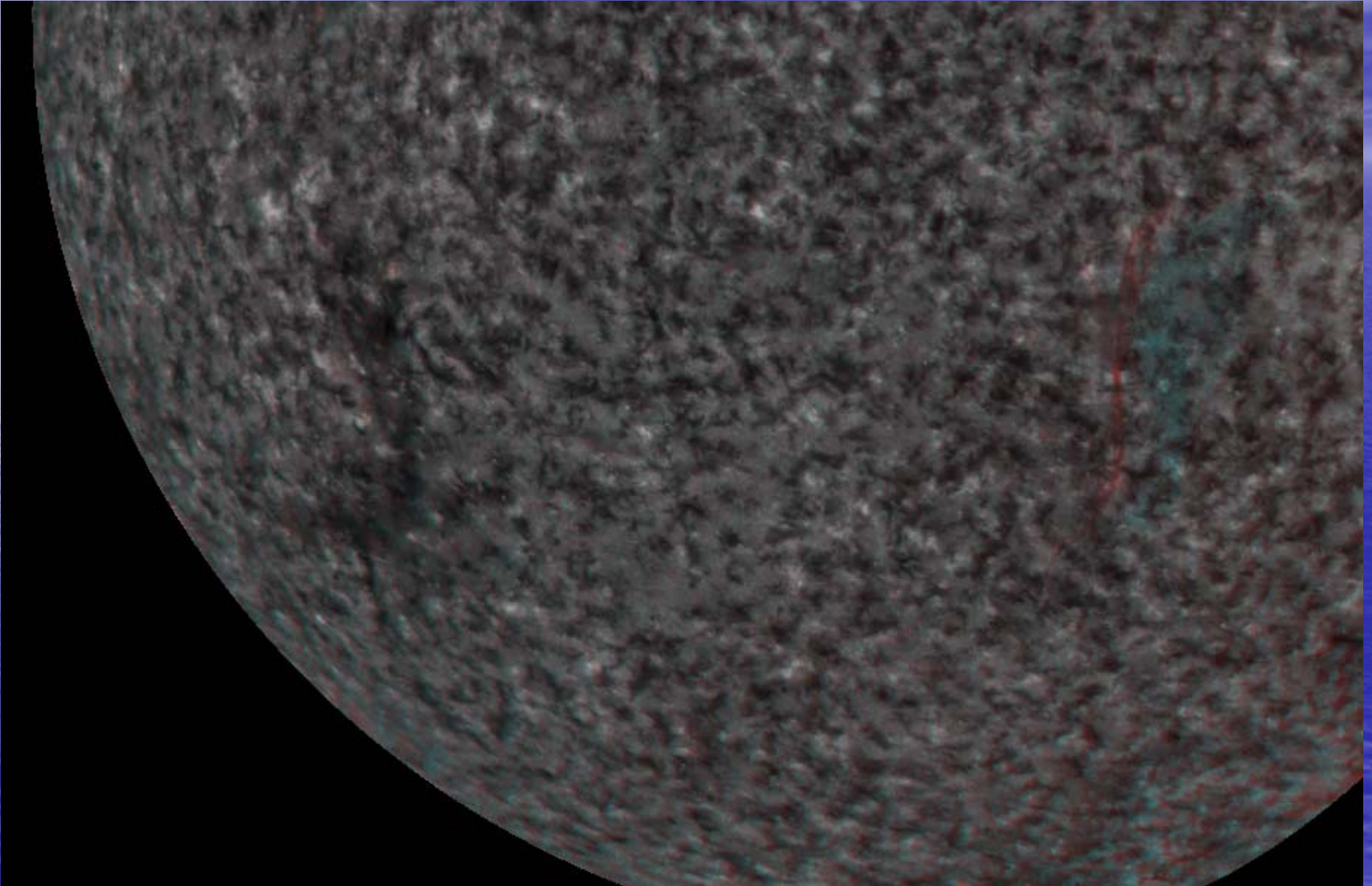
27 avril 2007



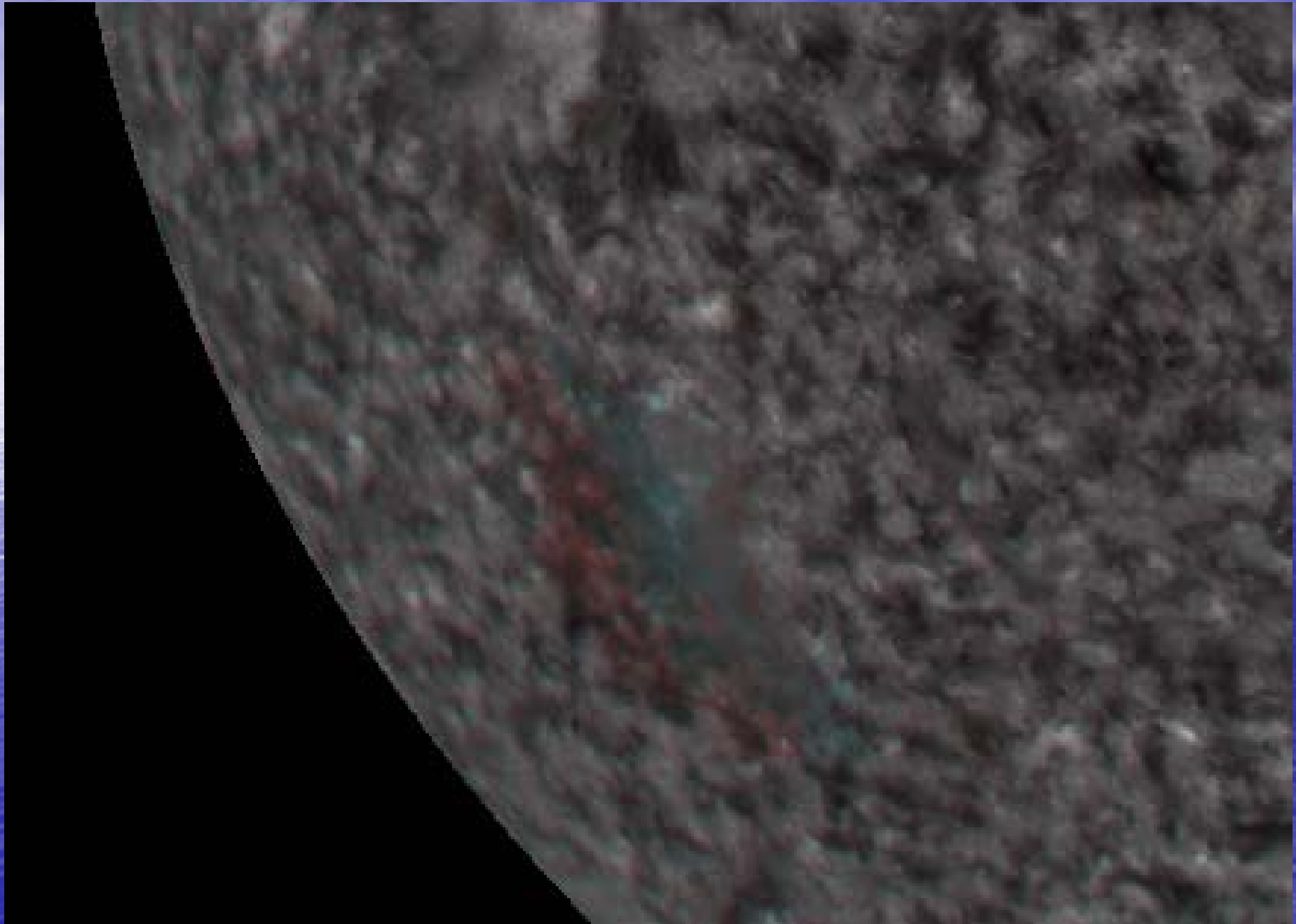
7 juin
2007



9 septembre 2007



26mai2007



26 août 2007

