

**Detection of quasi-stationary features
in MHD turbulence of molecular clouds
use the time-scale spectra**

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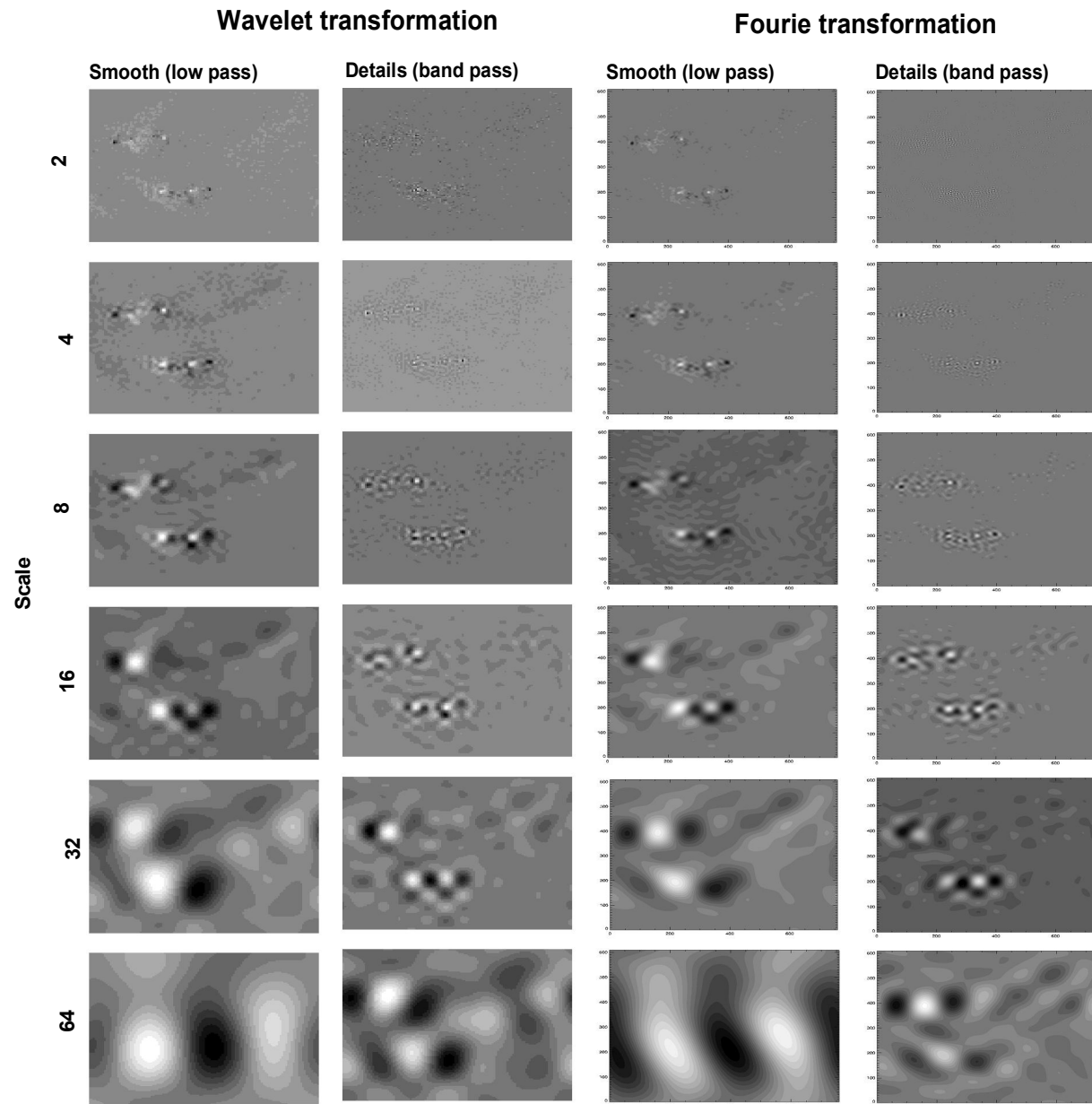
sych@iszf.irk.ru

Reinaldo R. Rosa

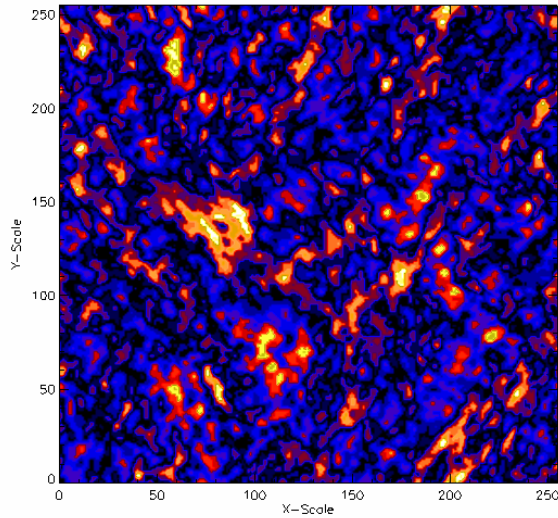
National Institute of Space Research, INPE,

Sao Jose dos Campos, Brazil

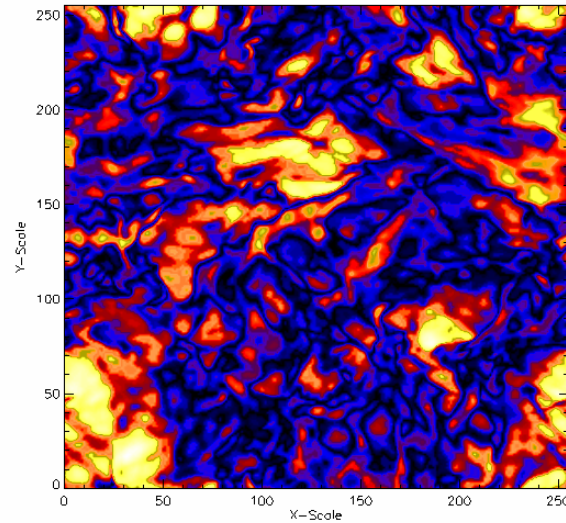
The Example of Wavelet and Fourier Image Decomposition



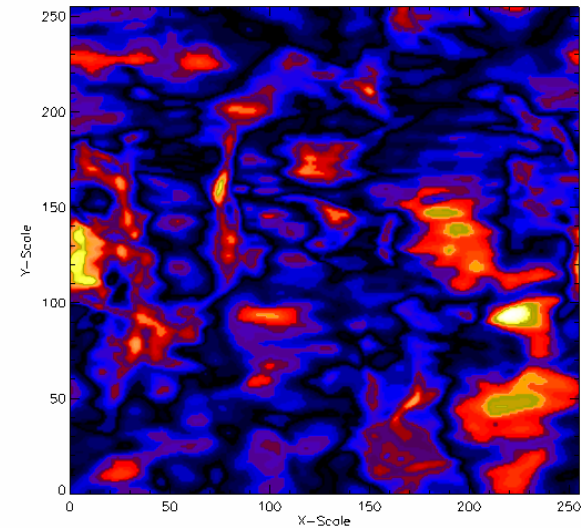
***The numerical simulations
of emission from MHD turbulence
in molecular clouds***



Frame 3

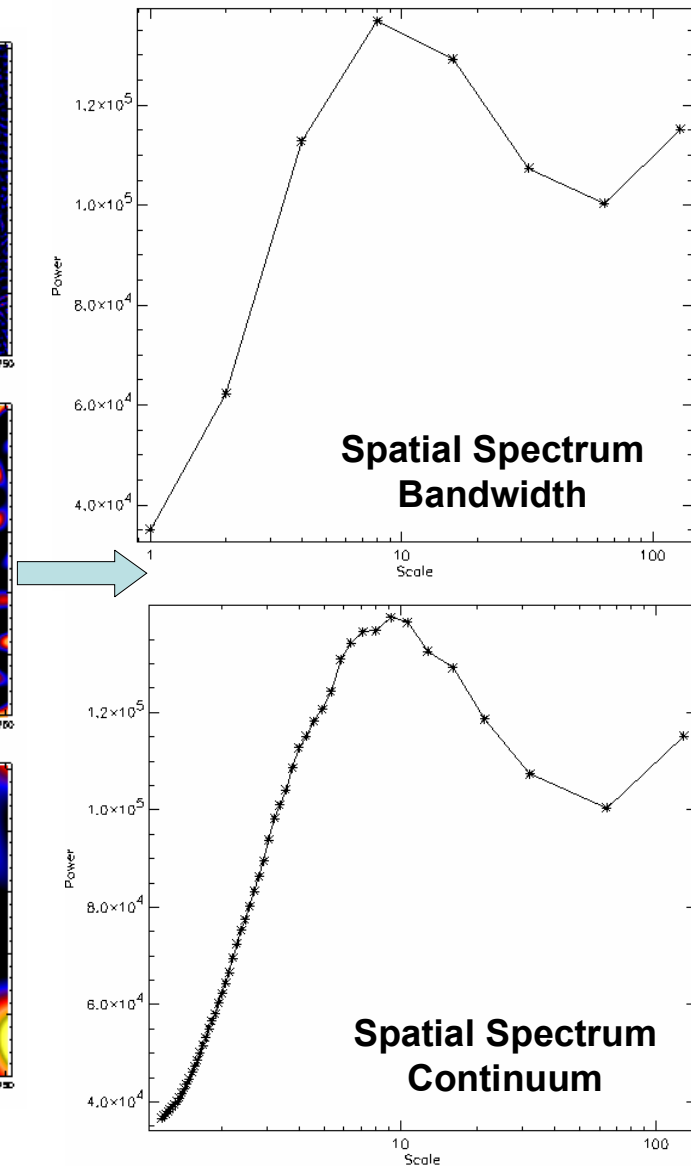
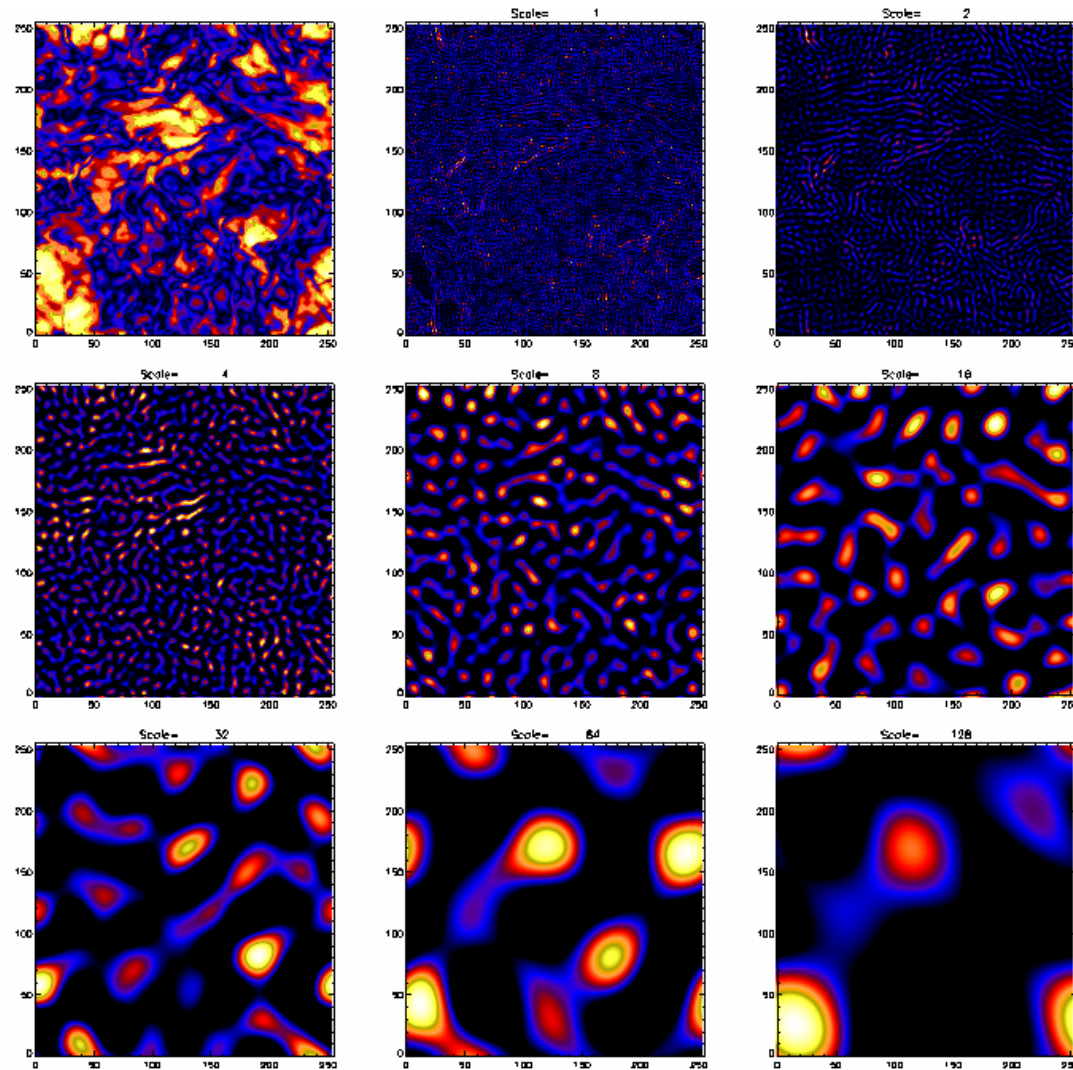


Frame 70

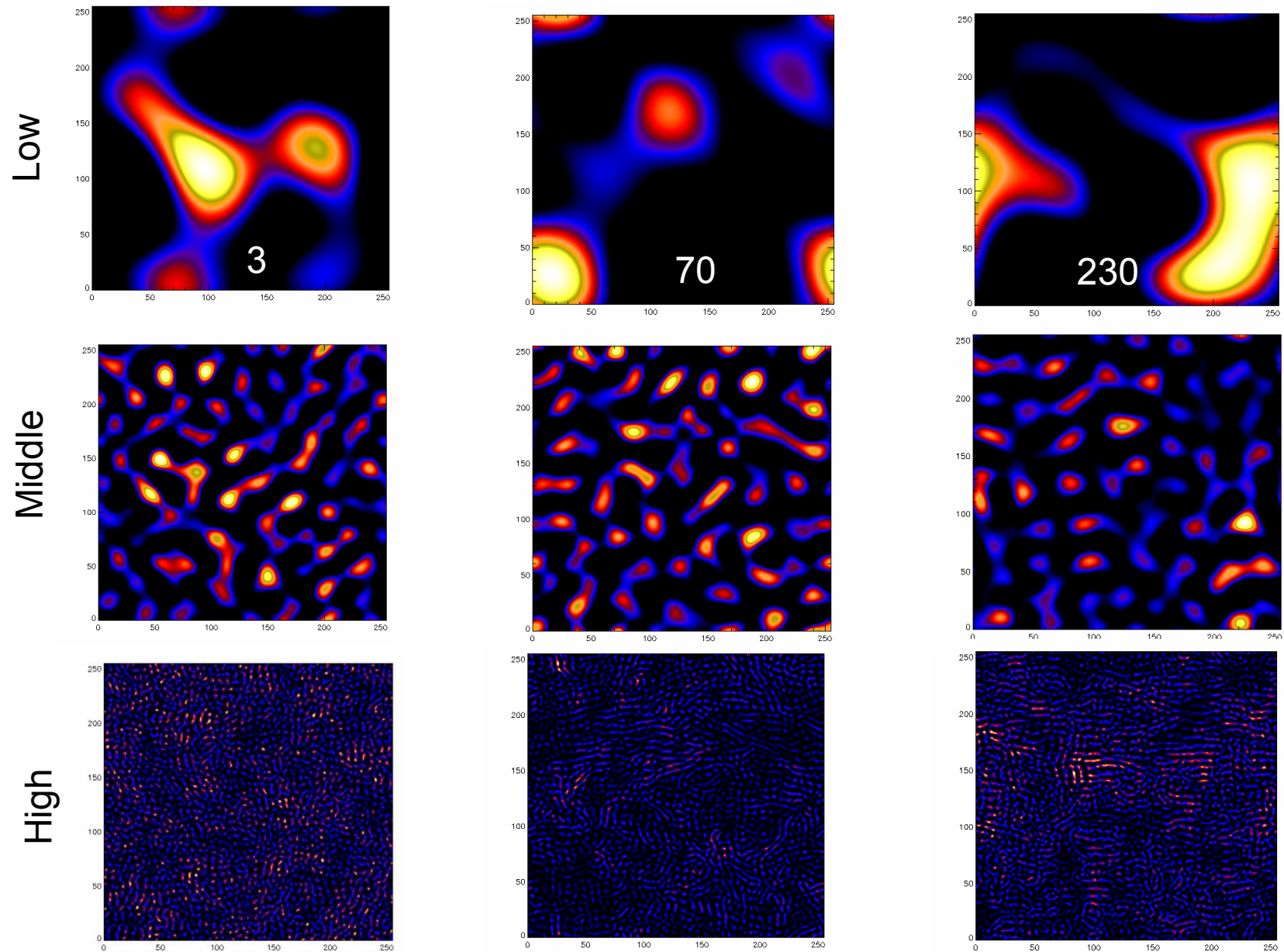


Frame 230

2D Fourier decomposition of the 70t frame. The images shows filtered frame at different space ranges (1-2, 2-4, 4-8, 8-16, 16-32, 32-64, 64-128, 128-256). The ranges of filtration are multiple two.

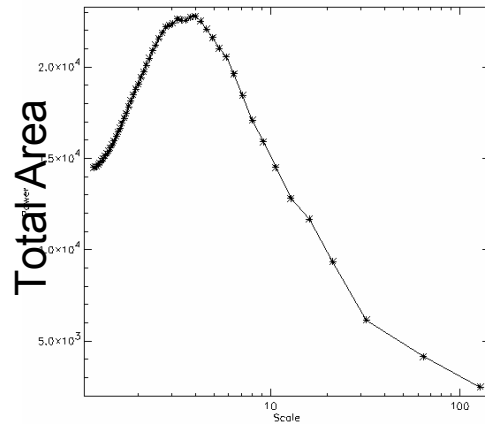
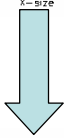
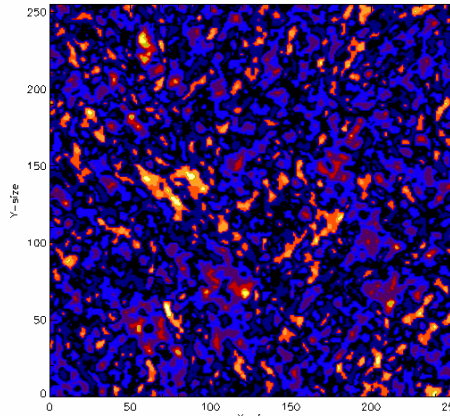


The temporal dynamics of 3, 70 and 230 frames for different spatial ranges (128-low, 16-middle, 2-high)



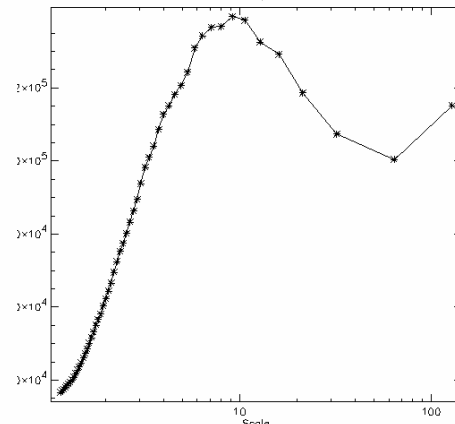
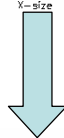
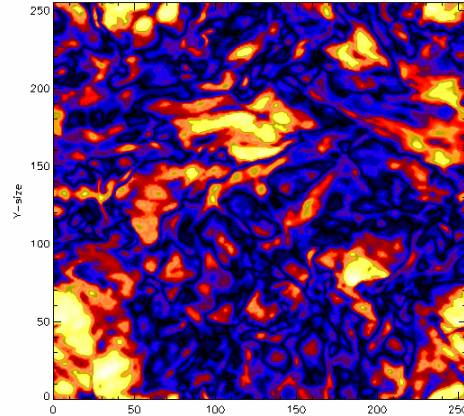
Temporal evolution of the spatial spectra

Frame 1



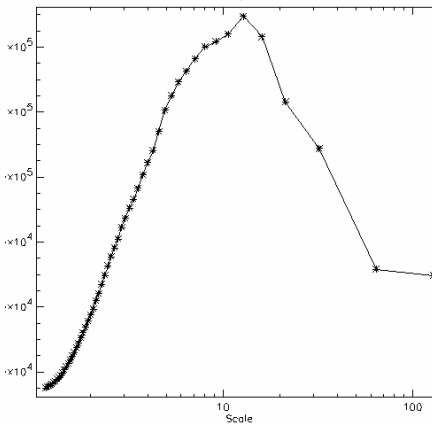
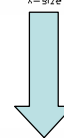
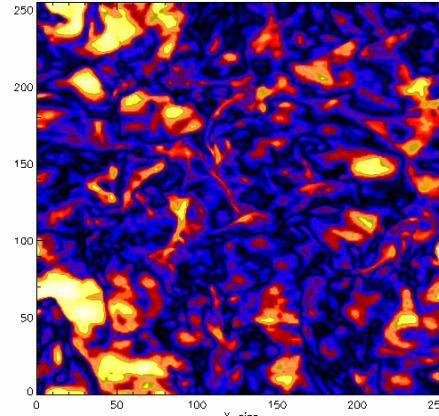
Scale

Frame 70



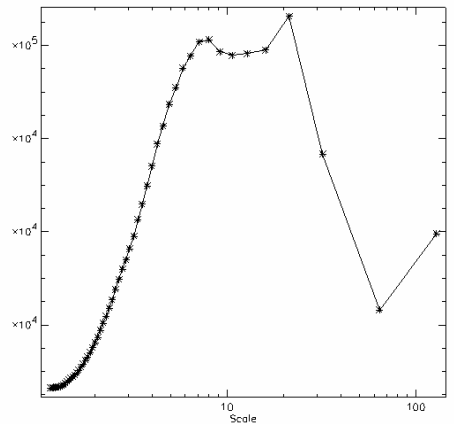
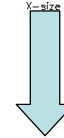
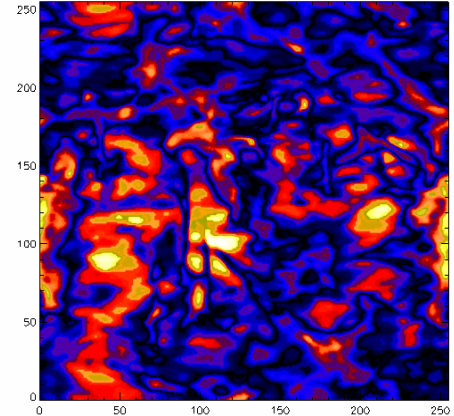
Scale

Frame 90



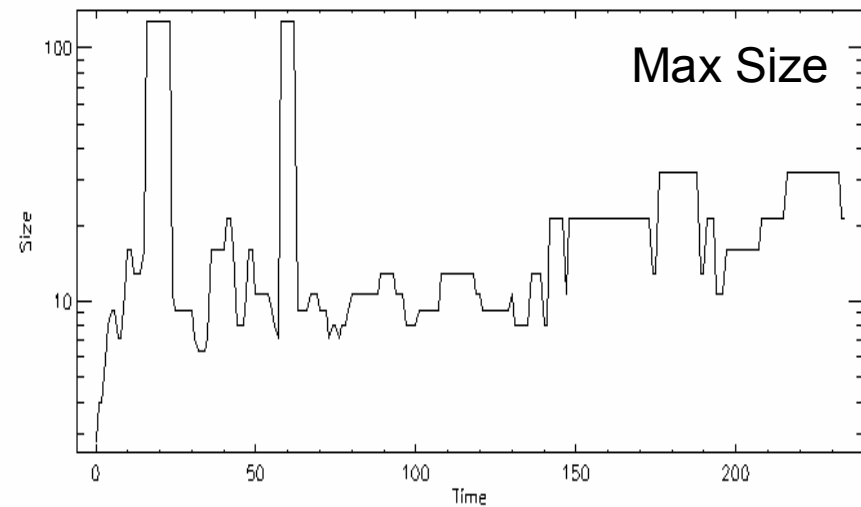
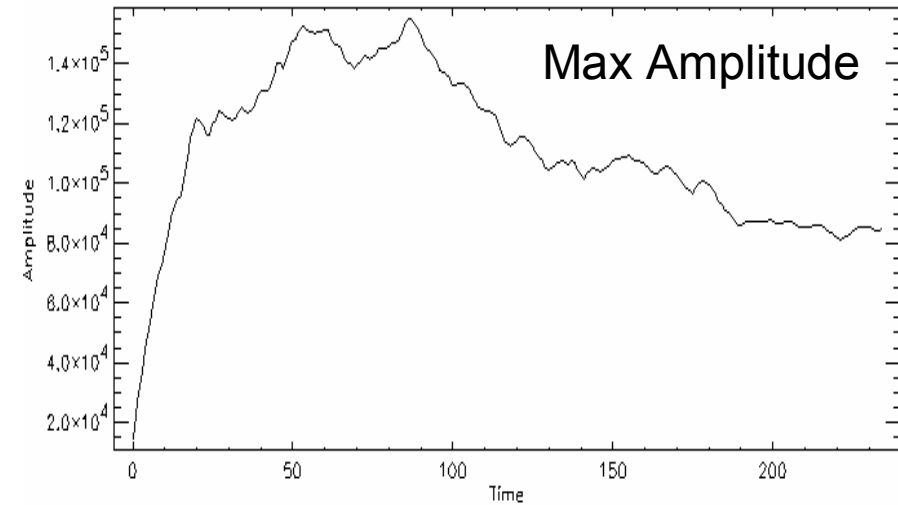
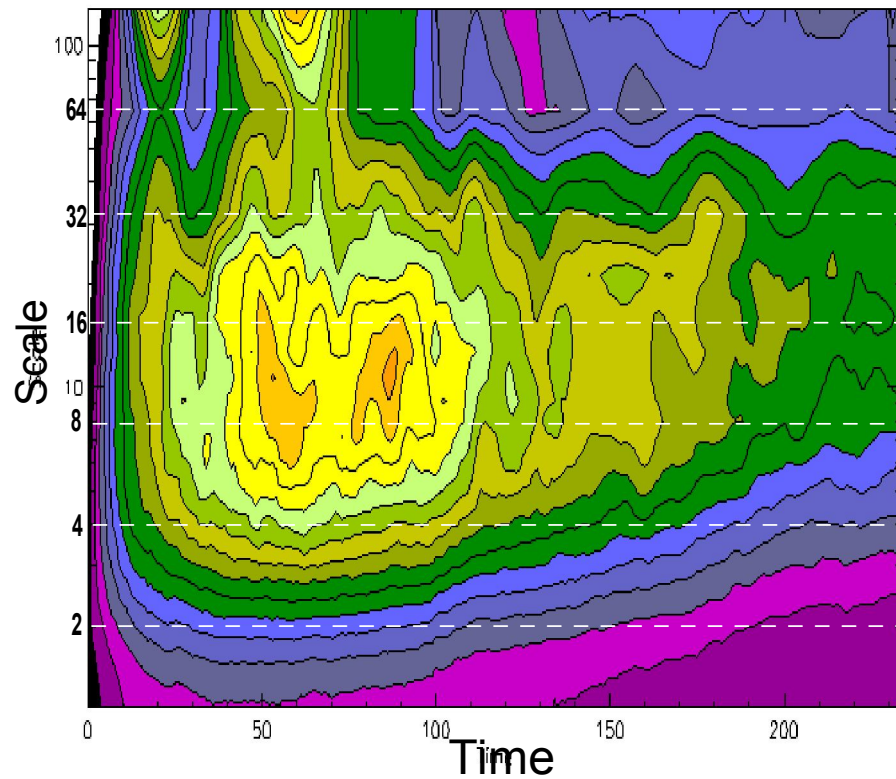
Scale

Frame 160



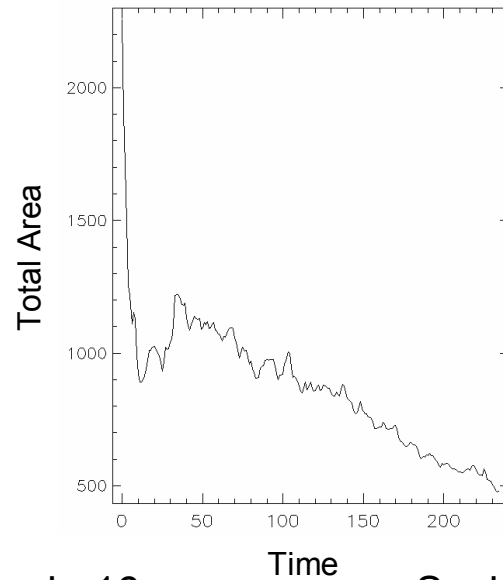
Scale

The 2D Time-Scale Fourier spectrum

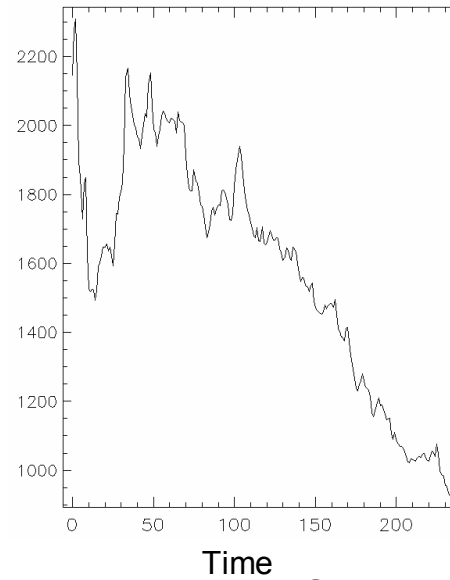


Temporal Dynamics of size features

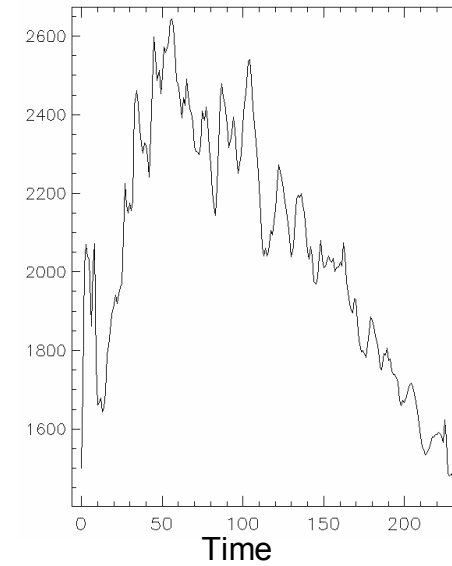
Scale 2



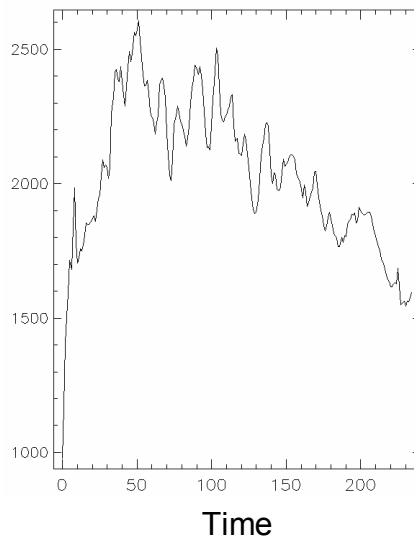
Scale 4



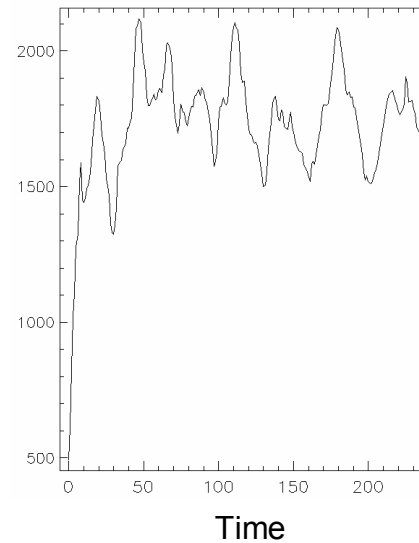
Scale 8



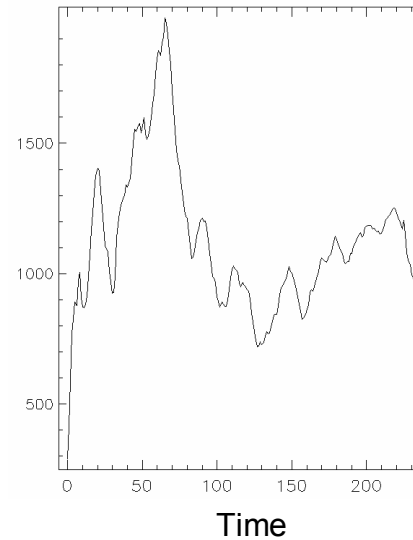
Scale 16



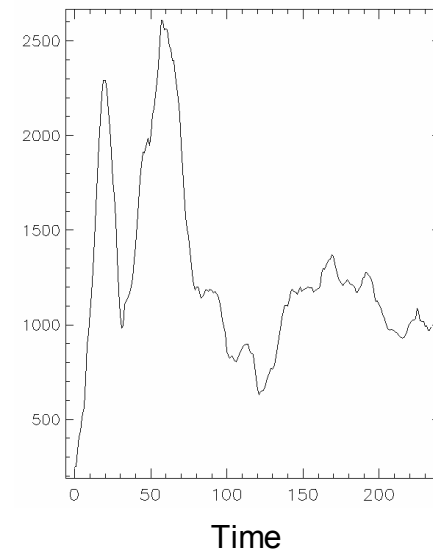
Scale 32



Scale 64



Scale 128



Conclusion

- ✓ Using two-dimensional Fourier transform the results of model calculations of space plasma temporal dynamics within its spatial structuring are obtained. It is shown that occurrence of molecular (plasma) clouds can be divided into two time phases.
- ✓ The first is connected with details small angular sizes and theirs turbulence formation, fast increase of maximal size and power emission at short time interval.
- ✓ The second phase is characterized smooth, linear increasing of the size details, falling power emission oscillating, transition from fast chaotic movements to slow displacement and formation big ordered spatial structures. Disappearance of details with small angular sizes is observed.