Introduction

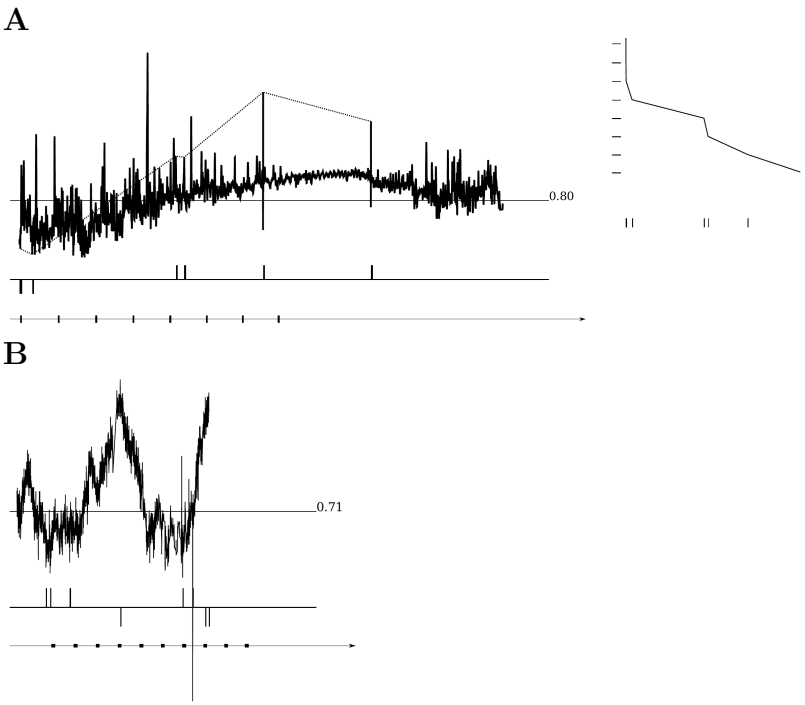

Figure 1 *(A) Radiation of Sun from 2000 to 2013 recorded by "ACRIM" satellite; left - fitting of outbreaks to approximated periods. (B) Extracts form satellite data records deposited in Univ. of South Carolina site, radiation of Sun in 2018. Labels on axes - Higuchi fractal dimension of time-dependent distributions, in both charts. Axes in bottom - positions of detected outbreaks and peaks of approximating log-periodic dependency.*

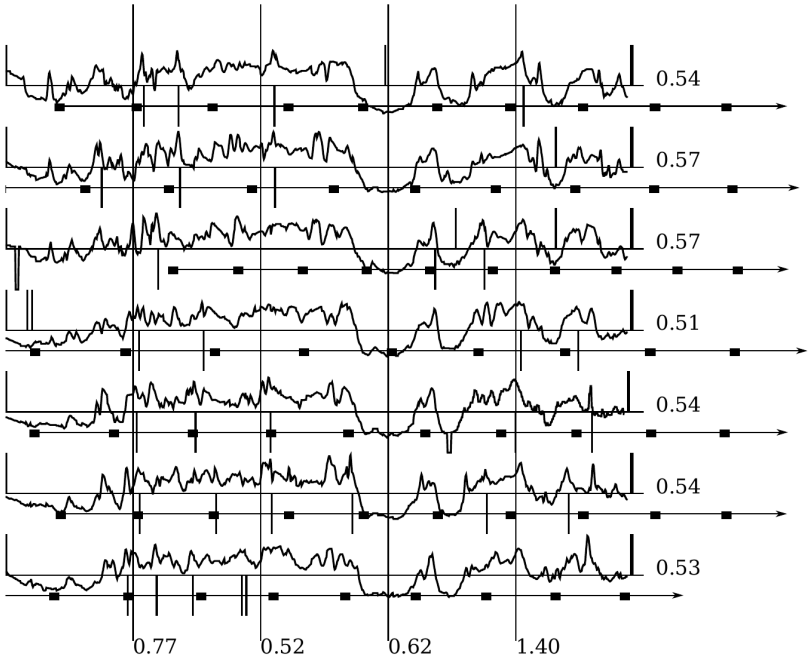

Figure 2 *Snapshot from video record of sun flaming 15.06.2002, deposited by Swedish physicists. Digits in column - Higuchi fractal dimension for spatial axis, digits in row - approximation of fractal dimension for time axis.*

Methods

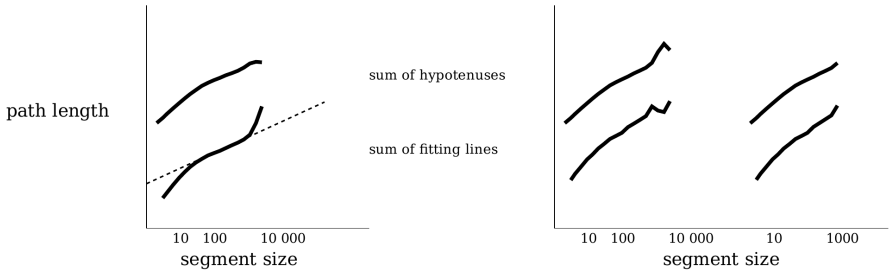

Figure 3 *Illustration of attempts to guess a presence of the log-periodic dependency.*

		test 1		test 2	
		method 1	method 2		
plain	dimension	0.577973	0.579382	0.49923	0.519842
	correlation	-0.983925	-0.969044	-0.947012	-0.925539
fit in full	direction	decceleration	decceleration		
	critical time	-711	-141		
	dimension	0.686096	0.880372		
	correlation	-0.992609	-0.996231		
fit in part	direction	acceleration	decceleration		
	critical time	+2	-141		
	dimension	0.677549	0.949008		
	correlation	-0.992127	0.996914		

Results

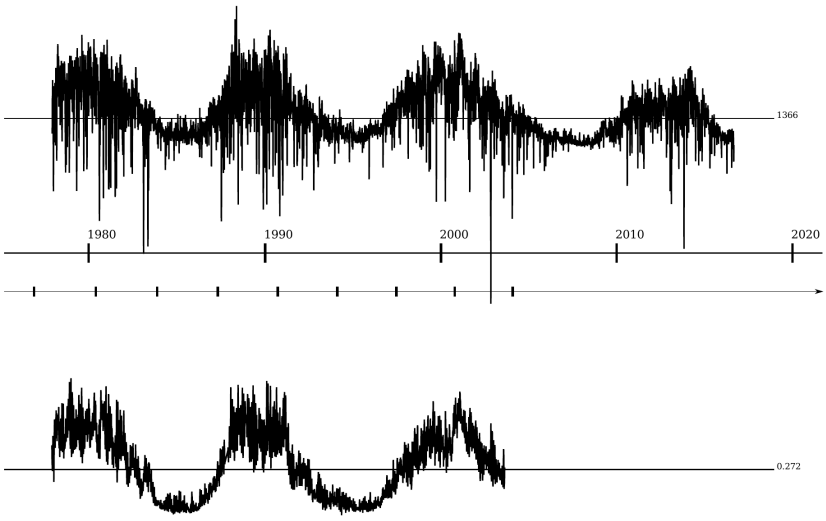

Figure 4 *Radiation of Sun in period from November 1978 to September 2017; in bottom - radiation at Mg frequency.*

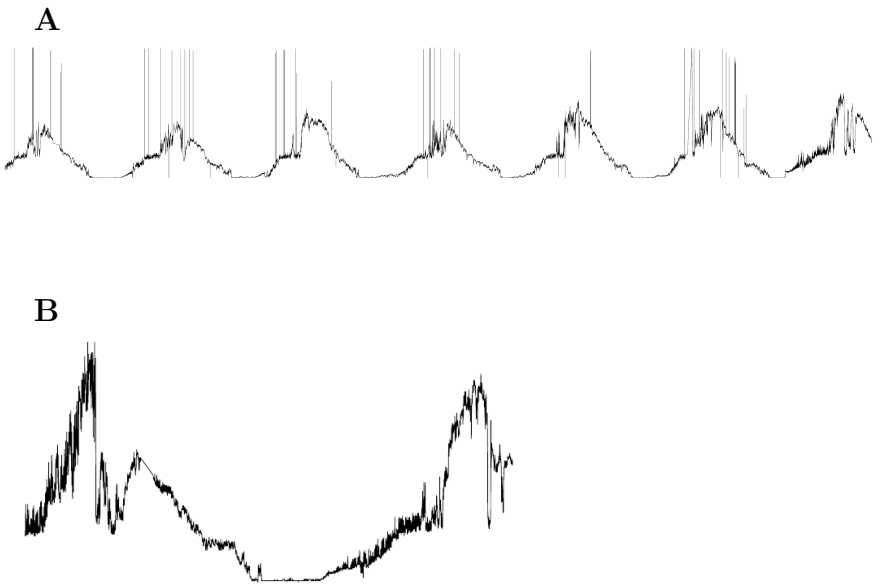

Figure 5 *Temperature of water in Baikal (A) series from May 2010 to October 2016; (B) series from May 2017 to September 2018.*

References

1. Nottale, L., Scale relativity and fractal space-time: theory and applications, *arxiv.org*, 2008

2. Feranchuk, S., Belkova, N., et al. *Limnology and Freshwater Biology*, 2018,

Appendix A

```
 cat usc_18.txt | awk -v i=0 -v b1=2458119.5 -v b13=7 '{ if ( i == 100 && substr(
$13, 1, 1 ) != "0" ) { s = s "," 10 * ( $1 - b1 ) "," 500 * (substr($13,1,7)
- b13 ); i = 0; }; i = i+1; } END { print substr( s, 2 ) }' | ./fractal_dimension
-d_xy
```