



[Home](#) / [2012](#) / [September](#) / [5](#) / Solar activity linked to Baltic winter severity

ARCTIC SOLAR

Solar activity linked to Baltic winter severity

🕒 12 years ago 👤 [Anthony Watts](#)

This paper [Solar forcing on the ice winter severity index in the western Baltic region](#), was published yesterday in the *Journal of Atmospheric and Solar-Terrestrial Physics*. It suggests that the winter severity index over the past 600 years in the Baltic region of the Arctic is “strongly modulated” by solar activity over periods as short as one decade, or in other words, the 11 year sunspot cycle. Me, I’m not so sure, because this would likely have been observed before if the correlation were so strong. OTOH, there’s the [recent story about the ice skating festivals on canals showing a correlation](#).

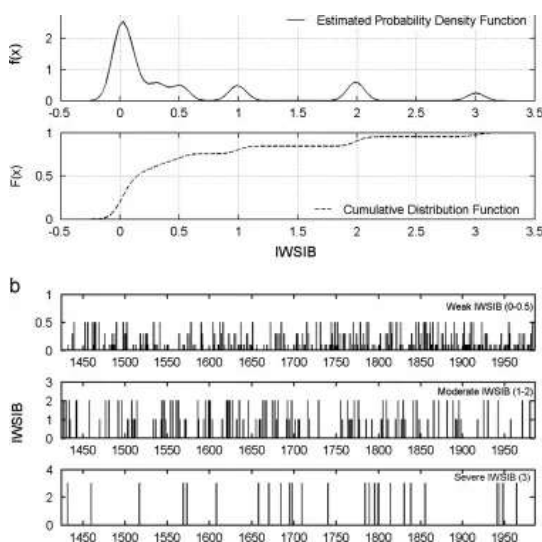


Fig. B2. a) The Power Distribution Function of IWSIB time series. b) The classification of the winter season.

[Solar forcing on the ice winter severity index in the western Baltic region](#)

M.C. Leal-Silv V.M. Velasco Herrera

Abstract

The Sun is the fundamental energy sources of the Earth’s climate and therefore its variations can contribute to natural climate variations. In the present work we study the variability of ice winter severity index in the Baltic Sea since the 15th century and its possible connection with solar activity, based in a new method for finding and measuring amplitude-phase cross-frequency coupling in time series with a low signal/noise ratio, we suggests that the ice winter severity index in the Baltic Sea is modulated by solar activity and solar motion in several frequency bands during the last 500 yrs. According to our model a strong coupling between the decadal periodicity in the ice winter severity index time series and the secular periodicity of solar activity is present. **We found that the ice winter severity index is strongly modulated by solar activity at the decadal periodicity.** We also found that the 180 year periodicity of the Barycentre motion modulates the amplitudes of the decadal periodicity of solar activity and the Ice winter severity index. This method represents a useful tool for study the solar-terrestrial relationships.

Highlights

- We present a new method for assessing amplitude-phase cross-frequency coupling.
- We applied the cross-frequency coupling method to different time series.
- The ice winter severity index is strongly modulated by solar activity.





Tags: [Baltic Sea](#)

45 COMMENTS

Oldest ▼

[tallbloke](#)

🕒 September 5, 2012 1:15 am

"We also found that the 180 year periodicity of the Barycentre motion modulates the amplitudes of the decadal periodicity of solar activity and the Ice winter severity index."

There are further evidences in the quiet northern seas too. Along the coast of Siberia and Canada and around Hudson Bay, the rebound of the continental masses from the weight of the melted ice sheets of the last glacial provides a natural steady temporal axis on which the variation in ocean conditions are recorded. There are beach ridges at regular 45 year intervals, the period of the return of the inner planets to the same configuration as 45 years previously. Larger ridges occur regularly at multiples of this interval, especially at 180 years.

This was researched many years ago by various people including Rhodes Fairbridge.

<http://tallbloke.wordpress.com/2011/06/30/further-terrestrial-evidence-of-planetary-cycles-affecting-climate/>

Good. More empirical evidence for our solar planetary theory. The momentum builds.

<http://tallbloke.wordpress.com/2011/08/05/jackpot-jupiter-and-saturn-solar-cycle-link-confirmed/>

+ 0 -

[Joe Public](#)

🕒 September 5, 2012 1:18 am

Headline:-

"Arctic winter severity linked to Solar activity" surely?

+ 0 -

[vukcevic](#)

🕒 September 5, 2012 1:33 am

I've been trying to push the idea for some time now, but than I am not supported by august institutions, and my ideas are not AGW compatible to be published

<http://www.vukcevic.talktalk.net/Arctic.htm>

<http://www.vukcevic.talktalk.net/NFC1.htm>

It is not sunspot cycle, it is an indirect interaction between the Earth's magnetic field (strongest in the Arctic) and geomagnetic storms that hit the Arctic at full blast.

+ 0 -

[ob](#)

🕒 September 5, 2012 1:37 am



Could you please reconsider whether the Baltic area has anything to do with the Arctic? Especially the western Baltic? If I understand it correctly we are talking about the sea area between Germany, Denmark and Sweden (more or less).



Derek Sorensen

September 5, 2012 1:53 am

I think a sensible question to ask might be whether we have sufficiently fine-grained "ice winter severity index" records going back that far to be confident of extracting anything, particularly when they state there is a very low signal-noise ratio.



vukcevic

September 5, 2012 2:00 am

tallbloke says:

September 5, 2012 at 1:15 am

.....

Not to forget Vukcevic:

<http://hal.archives-ouvertes.fr/docs/00/41/83/04/PDF/NATA.pdf>



ArndB

September 5, 2012 2:14 am

The authors seem to have relied on their "model" assuming that "a strong coupling between the decadal periodicity in the ice winter severity index time series and the secular periodicity of solar activity is present."

Unfortunately the Abstract give no indication whether they have checked the model result with reality in the: "ice winter severity index in the western Baltic region". One of the best historical example are the three war winters 1939/40, 1940/41 and 1941/42 in the Baltic Sea, which not only showed up with the first full ice cover since 1883, http://www.seaclimate.com/b/images/buch/big/B-16_iccover.png, but the most extensive sea ice during three subsequent winters ever observed, and is possibly one of the highest in one decade (the 1940s) during the Little Ice Age.

<http://www.seaclimate.com/b/images/rand/big/25.png>

For further information see: at: <http://www.seaclimate.com/b/b.html>: "B. A three-year cold package.

– Providing evidence?", starting with the observation by three time witnesses:

__Introduction: "The relevance of naval war on weather had been revealed to science in a neatly tied parcel for a long time. A number of scientists merely expressed their astonishment, but did not look for the physical causes, like Drummond:

- The present century has been marked by such a widespread tendency towards mild winters that the 'old-fashioned winters', of which one had heard so much, seemed to have gone for ever. (Drummond, 1943)

Rodewald (1948) emphasized that the winter of 1939/40 had come suddenly, and in contrast to the principle of conversion of the circulation and temperature deviation. Rodewald points to the air pressure aspects in the Atlantic during the months preceding these winters (1939-42) as follows:

- "From October to November a huge area of low depression covers most of Europe. The center with -11mb (from mean value) is stationed between Norway and Shetland, which is usually south of IcelandDecember shows an inverse picture. Europe is dominated by a pressure increase of +12mb (from mean value) with the center west of the Hebrides."

Liljequist (1943) identified this group of winters as the coldest ever observed in central Sweden, and presumably for the eastern Baltic as well. "



Jimmy Haigh



🕒 September 5, 2012 2:41 am

Derek Sorensen says:

September 5, 2012 at 1:53 am

"... there is a very low signal-noise ratio."

"Climate science" in a nutshell. Well, throw in the trillions of dollars as well – that helps.

+ 0 -

Doug Huffman

🕒 September 5, 2012 3:26 am

To this sensible question, the topic paper is behind a paywall and its data sources are not obvious to me. I found another paper, ten years old, that reported on three levels with high statistical confidence for change rates of 2 days per century 1529 – 1990.

+ 0 -

cui bono

🕒 September 5, 2012 3:31 am

"Arctic figures began in 1979 (which was rather late to draw a line)" as Philip Larkin didn't say. Given all the shipping traffic and the attendant measurements and observations in the preceeding decades, would it not be possible to have a project trying to pool all this information to gain a better approximation of ice extent, etc, at least for some years? Especially the 1930s and 40s, where reportage suggests scientific concerns that the ice would disappear altogether (plus ca change). I guess this would mean US, Canadian, British, Nordic and Soviet data being pulled together. Does this info still exist? Has anyone tried to use it in this way? Would it work? IDK – just a suggestion.

+ 0 -

tango

🕒 September 5, 2012 4:25 am

why not apply for a grant to study Solar Active link, I bet you would not get a bean

+ 0 -

Mike Mellor

🕒 September 5, 2012 4:35 am

Counting sunspots is to my mind just a trifle archaic. We now have satellites that measure Total Solar Irradiance down to the last joule.

Unless of course we're claiming that sunspot activity has an effect on climate similar to but separate from TSI? Then what is the mechanism? Or is it one of these woo things like telepathy?

+ 0 -

Shadowvigil

🕒 September 5, 2012 5:07 am

Reblogged this on [shadowvigil](#).

+ 0 -

matthu

🕒 September 5, 2012 7:02 am

Neither sunspot activity nor TSI is particularly relevant. It is magnetic flux and incoming high energy particles and possibly particular band widths of light.

+ 0 -



RHS

🕒 September 5, 2012 7:26 am

Tango, you may not get grant money to prove the correlation but likely to get money to dis-prove the correlation. After all, no matter how much money is thrown at a study, eventually everyone realizes the opposite of what is false is true. In short, a sheep in wolfs clothing will get better funding...

+ 0 -

the1pag

🕒 September 5, 2012 7:47 am

No more need for a job-killing, higher energy-cost forcing carbon tax — it's the sun, stupid!

+ 0 -

Mike Mellor

🕒 September 5, 2012 8:00 am

@matthu, links to the data please for the magnetic flux and incoming high energy particles you mention?

The TSI data from 1600-2010 is widely available. For example

http://lasp.colorado.edu/sorce/data/tsi_data.htm#historical

Up to 1950, charts show a strong visual fit to the temperature record.

+ 0 -

James of the West

🕒 September 5, 2012 8:06 am

Mike – sunspots are linked to solar geomagnetic activity. That geomagnetic activity changes dramatically compared to TSI which doesn't change much. The magnetic activity from the sun modulates incident cosmic rays upon the earth which some purport to be responsible for cloud seeding in high energy collisions with atmospheric particles. Cloud increases earth albedo and changes the earth's energy budget as well as modulating conversion of incident solar radiation in short wavelengths (sunlight) to low frequencies (IR) on contact with terrestrial objects which in turn modulates GHG role in the atmosphere though reduction in IR budget.

Look at the Be proxy timeseries to see what is happening to incident cosmic rays – Be is produced in collisions. Sometimes the sun is quiet and incident cosmic rays are quiet, if sun is quiet and we have a high level of incident cosmic rays that ought to increase global cloud cover if the theories of Svensmark are correct and in turn this may induce global cooling.

I'm yet to be convinced but I want to track it as time passes.

+ 0 -

Steven Mosher

🕒 September 5, 2012 8:13 am

Wow.

Before anyone has the time to read the paper, request the data and code and do a proper skeptical audit, the skeptics here have already endorsed the conclusions... group think.

+ 0 -

Maus

🕒 September 5, 2012 8:43 am



I'm not impressed. The Be10 and Barycenter charts aren't passing the smell test for me. And the coherent AM demodulator gives me the heeby-jeebies. Nothing fancy about it; it's identical to every digitally tuned AM radio (less the amp and speaker). But, depending on implementation and usage details, a PLL can do strange and untoward things. I don't have access to the paper, so I can't say that there are, or are not, any issues. But it does raise the question as to why traditional frequency analysis was found wanting and wasn't used.

+ 0 -
Ian W

🕒 September 5, 2012 8:59 am

Steven Mosher says:

September 5, 2012 at 8:13 am

Wow.

Before anyone has the time to read the paper, request the data and code and do a proper skeptical audit, the skeptics here have already endorsed the conclusions... group think.

You obviously skated Anthony's introduction Steven.

quote:

"Me, I'm not so sure, because this would likely have been observed before if the correlation were so strong."

There are those like Vuk and Tallbloke that have been saying this all along – and its not a lot different to Landscheidt and Fairbridge.

And on 'Group Think' I would remind you of a rather well known British saying: –

'It takes one to know one.'

+ 0 -

Steve (Paris)

🕒 September 5, 2012 9:01 am

Steven Mosher says:

September 5, 2012 at 8:13 am

Wow.

Before anyone has the time to read the paper, request the data and code and do a proper skeptical audit, the skeptics here have already endorsed the conclusions... group think.

Read the thread again Mr Mosher and I think you'll find you 'group think' accusation has no legs.

+ 0 -

Howard

🕒 September 5, 2012 9:18 am

If this paper is bent, I'm sure Leif Svalgaard can tell us without the data and code.

+ 0 -

Resourceguy

🕒 September 5, 2012 9:29 am

Hey, at least it got published. That is an accomplishment in these dark ages of group think, debate-has-ended science fraud on a massive scale. At least we get a feel for the living history of what Copernicus was up against. It puts a whole new light on history lessons.

+ 0 -

DesertYote

🕒 September 5, 2012 9:45 am



I'm a bit skeptical of the data, but studying the method is going to make a tasty meal with all that juicy math. They are using the sort of techniques used in my former field of microwave signal analysis. As for the data, a couple hundred years does not prove much, make it a couple thousand, and these guys might have a point.

+ 0 -

the1pag

Reply to [DesertYote](#)

September 5, 2012 10:06 am

Right on, Yote. But we don't have that much time before the carbon-taxing sheriff of EastAnglia skewers us with his religion-demanded impost

+ 0 -

jim2

September 5, 2012 10:10 am

This is why the paper, data, metadata, and code need to be accessible to the public.

+ 0 -

atheok

September 5, 2012 10:30 am

*"Steven Mosher says:
September 5, 2012 at 8:13 am
Wow.
Before anyone has the time to read the paper, request the data and code and do a proper skeptical audit, the skeptics here have already endorsed the conclusions...
group think."*

Did you drop by just to make unkind accusations? Or is this just another instance of warmer cherry picking?

Less than two dozen comments posted from a smaller group of people and you already know we are all of one like, one mind marching to one drum and not a serious question in the house? Yup, causation from assumed correlations combined with the assumptions of group think (AKA consensus in climate team terms), definitely a trait of the alarmists.

Shame on you. You definitely know better. Now, I'm reasonably sure a lot of us are humming while reading this thread over lunch and wondering just how the data and math stack up on this. And as has been indicated, we'd like to hear from some of the solar experts, especially Leif. Not that I absolutely accept all of Leif's statement's; but I am not able to argue against his math and analysis, so I accept Leif's logic until we can seriously test the sun. Long after I'm gone, I'm sure; but I can hope.

+ 0 -

wobble

September 5, 2012 10:50 am

*Mike Mellor says:
September 5, 2012 at 4:35 am
Counting sunspots is to my mind just a trifle archaic. We now have satellites that measure Total Solar Irradiance down to the last joule.
Mike Mellor says:
September 5, 2012 at 8:00 am
The TSI data from 1600-2010 is widely available.*

Obviously, we didn't have satellites in 1600.

+ 0 -

CEH



🕒 September 5, 2012 11:14 am

Could you please remove the reference to Arctic in your headline?

No part of the Baltic sea lies within the boundaries of the Arctic.

Pls goto Wikipedia and search for Arctic, they'll serve you with two definitions none of which applies to the Baltic sea.

+ 0 -

P. Solar

🕒 September 5, 2012 12:27 pm

This bring me back once again to this article on HadSST3 adjustments:

<http://judithcurry.com/2012/03/15/on-the-adjustments-to-the-hadsst3-data-set-2/#comment-188237>

Figure 4 <http://curryja.files.wordpress.com/2012/03/hadsst3-cosine-fit1.png>

shows that the difference between hadSST3 and the original ICOADS data can be characterised by the sum of 184 y and 67y cosine. The Fourier analysis also shows the Hadley processing stomps out any long term periodicity.

The dataset was not long enough to reach to 180 y cycles in the Fourier plot but the commentary notes:

" The presence of a longer periodic signal running strongly to the end of the graph, where it converges with the non-cyclic residual shows there is a cyclic variation of more than 160 years in duration. "

+ 0 -

Ulric Lyons

🕒 September 5, 2012 12:29 pm

"Me, I'm not so sure, because this would likely have been observed before if the correlation were so strong."

Google scholar brings up quite a number of papers on the solar cycle in relation to -NAO, QBO, and cold N. Hemisphere winters, I think the main problem with anything solar is one of acceptance. As for the Sirocco paper, in prescribing specifically solar minima, it overlooked several Elftedentocht events and frozen Rhine winters, and some of the coldest European winters in the last 400yrs that all happened to be on solar cycle maxima. The clustering of cold events just after minima, and on and just after maxima is highly indicative of the low points in geomagnetic activity being the reason rather than an absence of spots. I can't see how the analytical approach of the above paper helps either, when we can look at each cycle individually against the daily geomagnetic (or solar plasma speed) record.

+ 0 -

Ulric Lyons

🕒 September 5, 2012 1:27 pm

"We also found that the 180 year periodicity of the Barycentre motion modulates the amplitudes of the decadal periodicity of solar activity and the Ice winter severity index."

It can be easily shown that it has nothing to with barycentric motion by looking at suitable heliocentric analogues of the four Jovian planets. Such as 1838 and 1976, the weather/climatic conditions were completely different: <http://www.fourmilab.ch/cgi-bin/Solar>

+ 0 -

Nick Kermode

🕒 September 5, 2012 1:50 pm

"in the Baltic region of the Arctic"

Where in the world is that? As far as I am aware the "Baltic region" lies entirely outside the Arctic. Seems a bit disingenuous.

+ 0 -



vukcevic

🕒 September 5, 2012 2:58 pm

You shouldn't be so harsh on our host. One part of Baltic is just outside arctic circle

http://nsidc.org/arcticmet/images/arctic_map.gif

closest at 65.30'N

+ 0 -

Derek Sorensen

🕒 September 5, 2012 5:41 pm

Steven Mosher says:

September 5, 2012 at 8:13 am

Wow.

Before anyone has the time to read the paper, request the data and code and do a proper skeptical audit, the skeptics here have already endorsed the conclusions...

group think.

Can't speak for others, Steven, but my first comment in this blog was to question whether the data was capable of supporting the conclusion.

I'll see your "group think" and raise you a "knee jerk".

+ 0 -

Pamela Gray

🕒 September 5, 2012 7:03 pm

I'll anti up. Assume much Steven? Makes an ass out of u and me. I am also not convinced to even a small degree regarding solar influence on temperature trends and oscillations of the kind referred to in this paper.

Persuasive voice is similar to what you have chosen to use in your comment. It is a lower form of debate. You are better off using the argumentative voice in science debate. Unless you did not intend to enter into science debate. Caustic remarks are seldom appropriate in such debate and makes me think your intent was not to advance a scientific discussion but a political point you wish us to believe in.

+ 0 -

Nick Kermode

🕒 September 5, 2012 9:41 pm

Vukcevic says.....

You shouldn't be so harsh on our host. One part of Baltic is just outside arctic circle.....closest at 65.30'N

Thats still 10 12 degrees from the western baltic referenced in the paper. I don't see it as harsh at all to hold Anthony to the same standards as he holds everyone else to. His dedication to accuracy for particularly climate science is responsible for the popularity of this website, and will cause rethinks and revisions that further our understanding. But if he doesn't hold himself to the same standards then he just looks hypocritical, to this reader anyway..

+ 0 -

george e. smith

🕒 September 6, 2012 12:16 am

""""Solar activity linked to Baltic winter severity.....""""

Well I'd put my money on: 'Baltic winter severity linked to Solar activity.'

But that's just my opinion.



And as to that other donnybrook, I have always considered > +60 as the Arctic, and <-60 as the Antarctic.

If I mean Arctic or Antarctic circles, I say so.

+ 0 -

george e. smith

🕒 September 6, 2012 12:22 am

.....Mike Mellor says:

September 5, 2012 at 4:35 am

Counting sunspots is to my mind just a trifle archaic. We now have satellites that measure Total Solar Irradiance down to the last joule.....

No wonder they get it wrong. Joules is energy or work, and Irradiance is Watts per metre squared.

+ 0 -

george e. smith

🕒 September 6, 2012 12:24 am

Is the Antarctic peninsula in the Antarctic ??

+ 0 -

Poptech

🕒 September 6, 2012 6:50 am

Steven Mosher says:

September 5, 2012 at 8:13 am

Wow.

Before anyone has the time to read the paper, request the data and code and do a proper skeptical audit, the skeptics here have already endorsed the conclusions... group think.

You wouldn't know what a proper skeptic audit is. These ridiculous comments are why I stopped recommending his book. I can proudly say I never bought it.

+ 0 -

ob

🕒 September 6, 2012 6:53 am

with respect to the arctic discussion. Yes, if they considered the Gulf Of Bothnia (the eastern Baltic) I wouldn't mind too much. But they consider the western Baltic and that's a tiny bit below 60N.

+ 0 -

E.M.Smith

Editor 🕒 September 6, 2012 11:49 pm

Oh My! May wonders never cease. An article on WUWT with the B-Word in it 😊 (Bary...)

While I'd love to hop on the "Oh Boy!" band wagon, I notice one glaring issue. It says it has a link to the 180 year period of Bary.... motion. It may have nothing at all to do with that. In orbital mechanics there is a very large tendency to 'orbital resonance'; so things like meteor storms and lunar / tidal cycles have periods that all "coordinate". You can't attribute "causality" only "coincidence with a chance of correlation"...

Oh, and I notice that Mosher, in a fit of "knee jerk", lept of the cliff of conclusion...

So I'm happy to see the **question** of an orbital mechanics related **correlation** being given some air time; but it's a very long ways from that to anything involving **causality** and even further to anything directly tied to the B-Word effect or the sun. (Best explanation I've seen so far for many of the cycles involves a lunar / tidal pattern:

<http://www.pnas.org/content/97/8/3814.full>



The maxima, labeled A, B, C, D, of the most prominent sequences, all at full moon, are spaced about 180 years apart. The maxima, labeled a, b, c, of the next most prominent sequences, all at new moon, are also spaced about 180 years apart. The two sets of maxima together produce strong tidal forcing at approximately 90-year intervals.

My more rampant speculations based on that paper here:

<http://chiefio.wordpress.com/2011/11/03/lunar-resonance-and-aurid-storms/>

But THE **key take away** is that “things in space are coordinated” via orbital resonance. Just ‘cause you get a ‘wobble match’ to the sun, doesn’t mean it isn’t the Moon / tides doing the deed and on a very similar schedule...

Me? I’m not leaping off any “cliffs of conclusion” but more admiring all the views from the tops... and think this one is a mighty fine one. Needs no explanation for the solar TSI disconnect, no explanation for why weather results don’t always land on the B-word moments, yet does explain the 180 year cycle showing up and does explain the “coordination” with the major gas planet positions as they stir the orbital resonance pot... So it’s a tidy explanation.

Oh, and tides causing differential stirring of ocean currents and cold deep water is a very direct potential mechanism. Even gives a multiple of the 60 year PDO cycle as further ‘harmonic’ oscillation possibilities...

+ 0 -
pkatt

September 11, 2012 6:54 pm

For some years we have known that one side of Antarctica has been massing ice while the other was losing ice, why on Earth wouldn’t the same be true of the Arctic? Seems like smoke and mirrors not to notice for instance that the Bering Sea has had “a positive anomaly” 4 out of the past 5 yrs.. I wonder if we are ignoring a similar pattern to that of Antarctica or not seeing it because of the land/ocean ice mix of the area, which would not be counted in the SEA ICE.

+ 0 -

1



MonsterInsights

