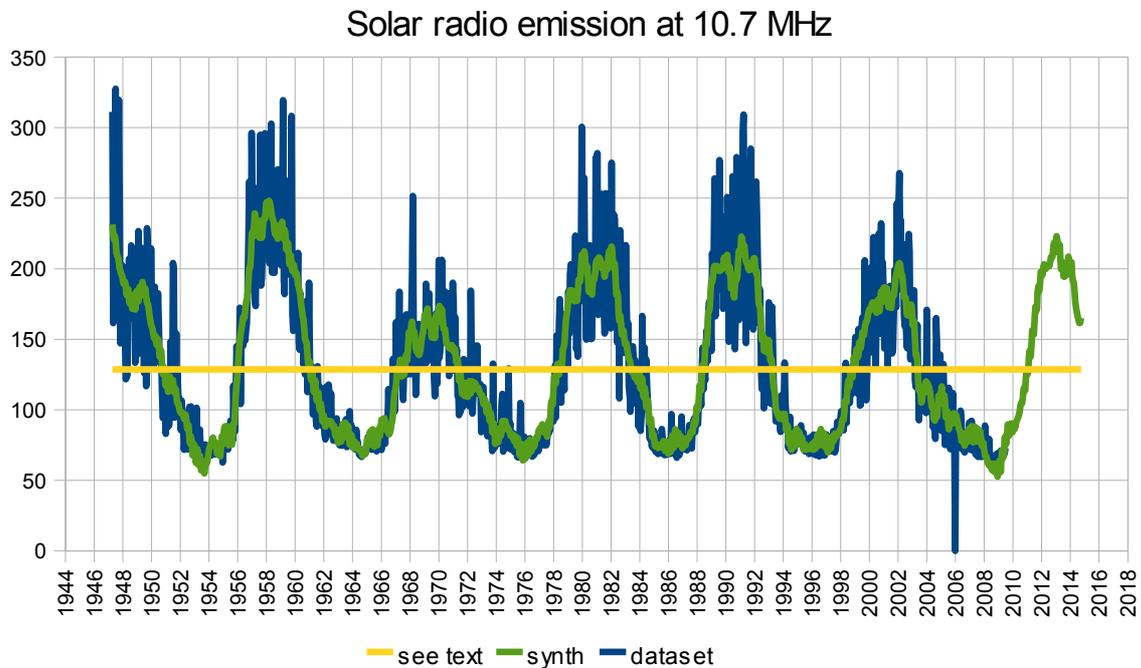


A look at solar radio emissions

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Newbury, UK



Blue trace is the actual radio signal strength.

Green data is the output of a synthesizer which has attempted matching the actual data. A synthesizer can of course be run outside of the time frame of the input data. It may or may not be valid for hindcast or forecast, a human decision based on extra knowledge.

Yellow trace is components from the synthesizer and in following graphs will be used to tell a tale.

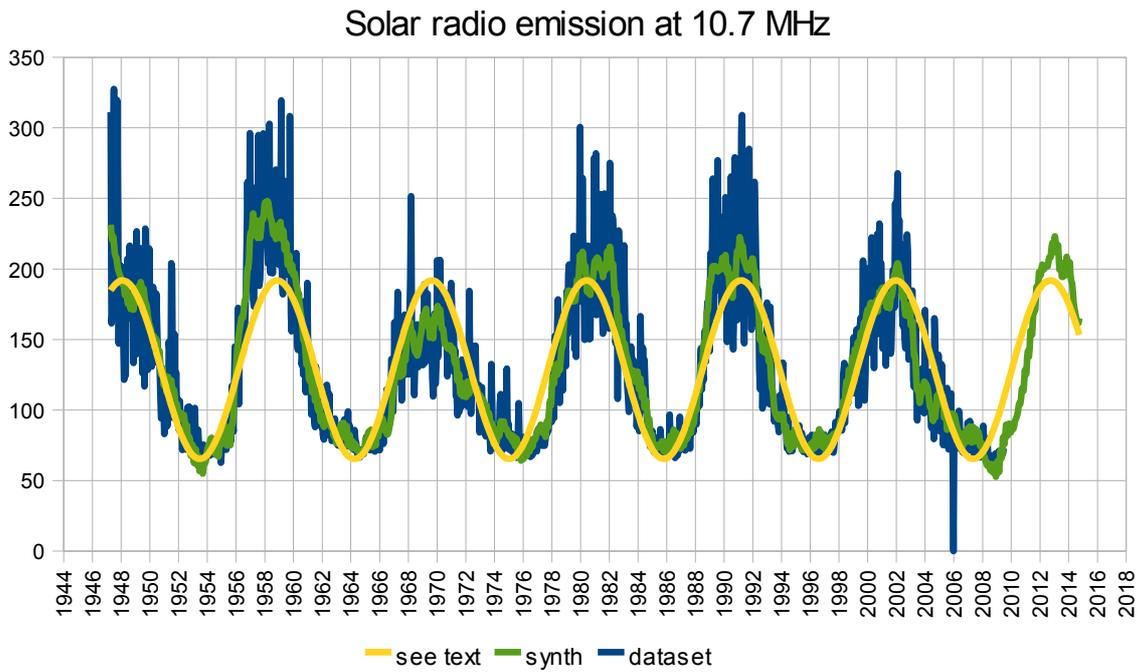


Illustration 1: First component 10.77 years

Nothing surprising in this, somewhere around the 11 year solar cycle is dominant.

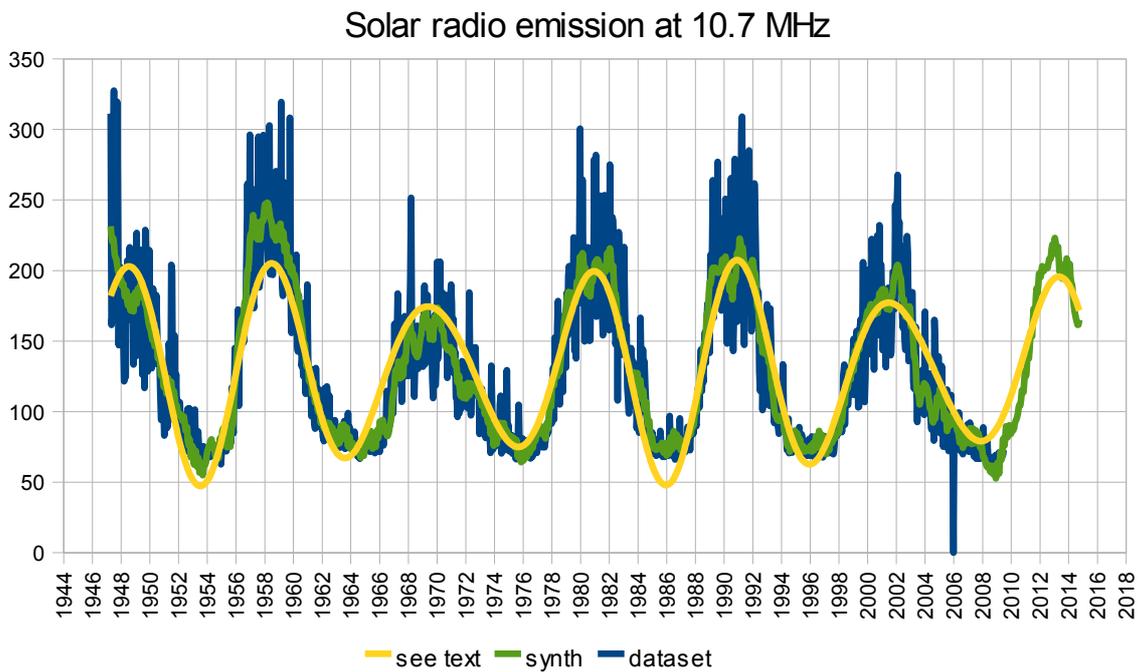


Illustration 2: Plus 2nd, 8.16y

Now it gets curious. Adding one term explains most of the uneven heights.

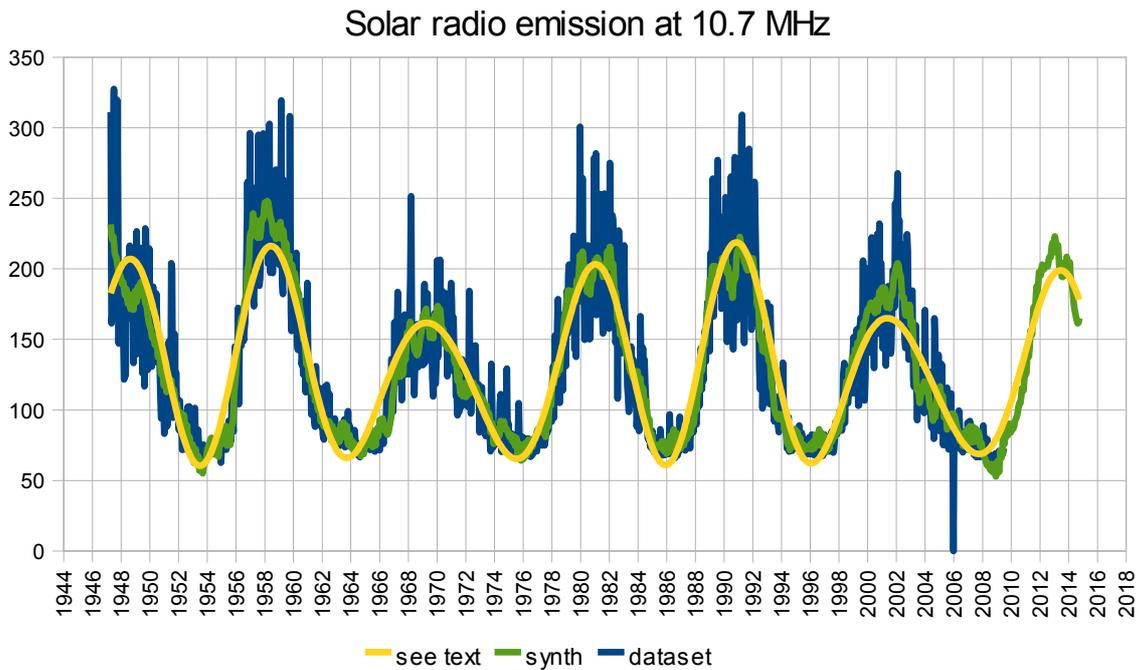


Illustration 3: Plus 3rd, 32.56y
 Next up improves the result.

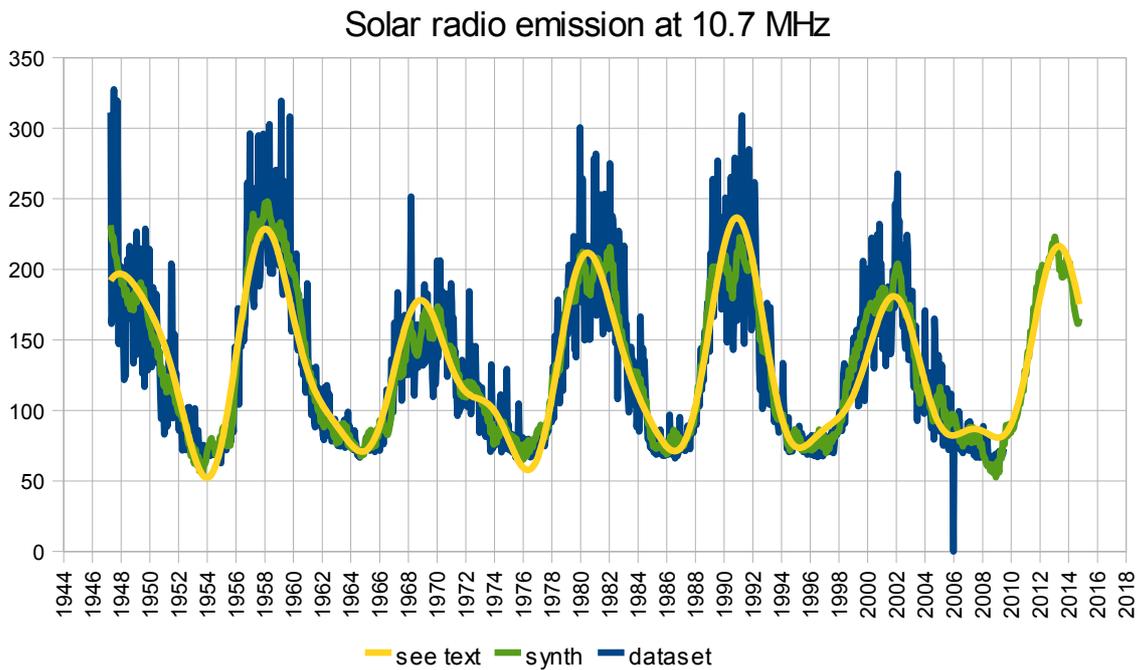


Illustration 4: Plus 4th, 5.57y

Just four components (plus offset) almost completely explains the whole shape. This last item suddenly adds details which at first sight look complex but are really rather simple.

This also seems to explain a late start to cycle 24.

Is there underlying meaning?

No-one knows but it is unlikely to be random relationship.

Lets look at the maths.

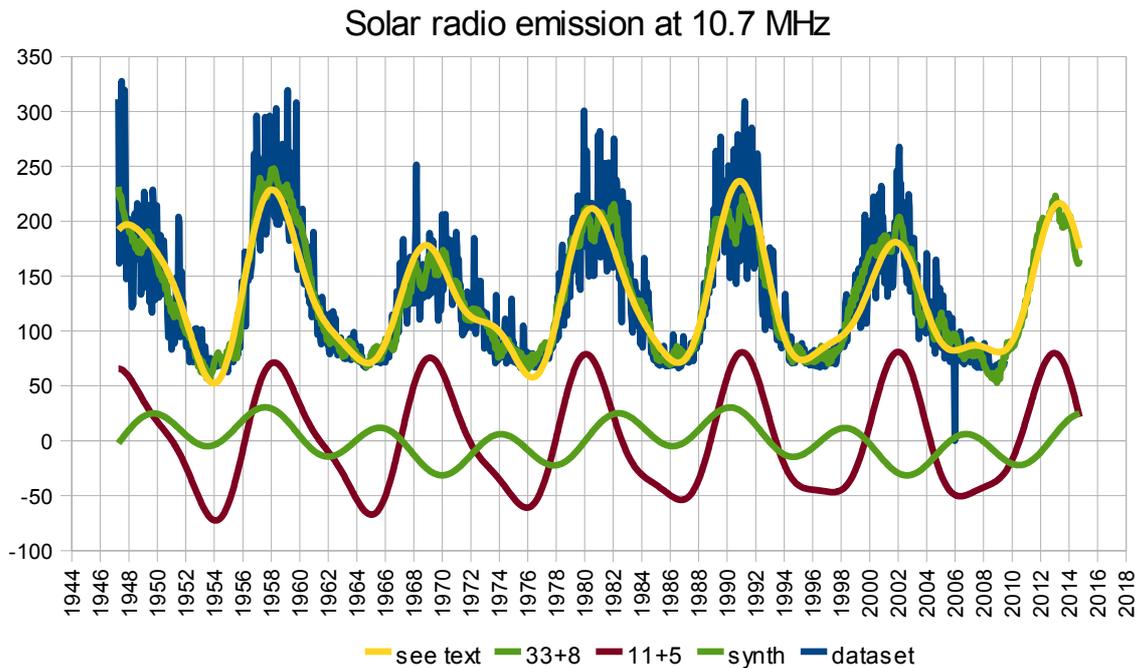


Illustration 5: Adding pairs of factors, see text below

10.77	1.09	63.24	0
8.16	-0.16	18.17	0
32.57	0.05	13.88	0
5.57	2.58	17.83	0

These are all closely related harmonically.

32.57			
10.77 *3=	32.32	100.76%	0.76%
8.16 *4=	32.64	99.76%	-0.24%
5.57 *6=	33.41	97.48%	-2.52%

Less than 1% out from exact harmonics is remarkable if it is chance, yet with exact synchronism the results would be very different.

phase	adj	
	0.05	0.05
	1.09	1.09
	-0.16	-0.16
	2.58	1.01

Phase tells an even odder story.

The phase of 33y and 8y is almost identical.

The phase of 11y and 5.5y differs by almost exactly $\pi/2$, a very telling amount. $2.58-\pi/2=1.01$

Illustration 5 shows these similar phased items combined. Add those two together and that is the yellow line.

How accurate is the result?

Rather critical is the accuracy of the underlying data. This is in my opinion far from reliable, with equipment and location changes. (story I am not relating)

The analysis found solar rotation data much earlier than I expected. Although not reported here this data seems to be quite interesting and far more complex than expected.

The raw data underlying this work was labelled by the providing FTP server "Solar-10.7cm-Flux-(observed)_1947-Jan-01_2009-Apr-03" and came from the UK Solar database associated with Rutherford Appleton Lab and is daily data.

Observed data includes the annual variation caused by the changing earth/sun distance. (radio wave propagation follows the usual isotropic radiation curve, inverse square law vs. distance)

The data has not been properly decimated for graphing (there is aliasing) so it is broadly illustrative only.