Did Cycle 24 Peak in the Fall of 2011?

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I've seen recent comments that Cycle 24 peaked in the Fall of 2011. There's no doubt that last Fall was extremely good for worldwide propagation on 10-Meters. For example, big East Coast stations in the CQ World Wide DX contests (October and November 2011) and the ARRL 10-Meter contest (December 2011) saw QSO totals of around 3,000 on 10-Meters. But the same big East Coast stations only made about 600 QSOs in the ARRL DX contests and CQ WPX contests in the Spring of 2012. Thus based solely on QSO totals, one could come away thinking that Cycle 24 peaked in the Fall of 2011.

Now we measure solar cycles using smoothed indices – either the smoothed sunspot number or the smoothed 10.7 cm solar flux. The green line in Figure 1 is the smoothed 10.7 cm solar flux data for the ascent of Cycle 24.

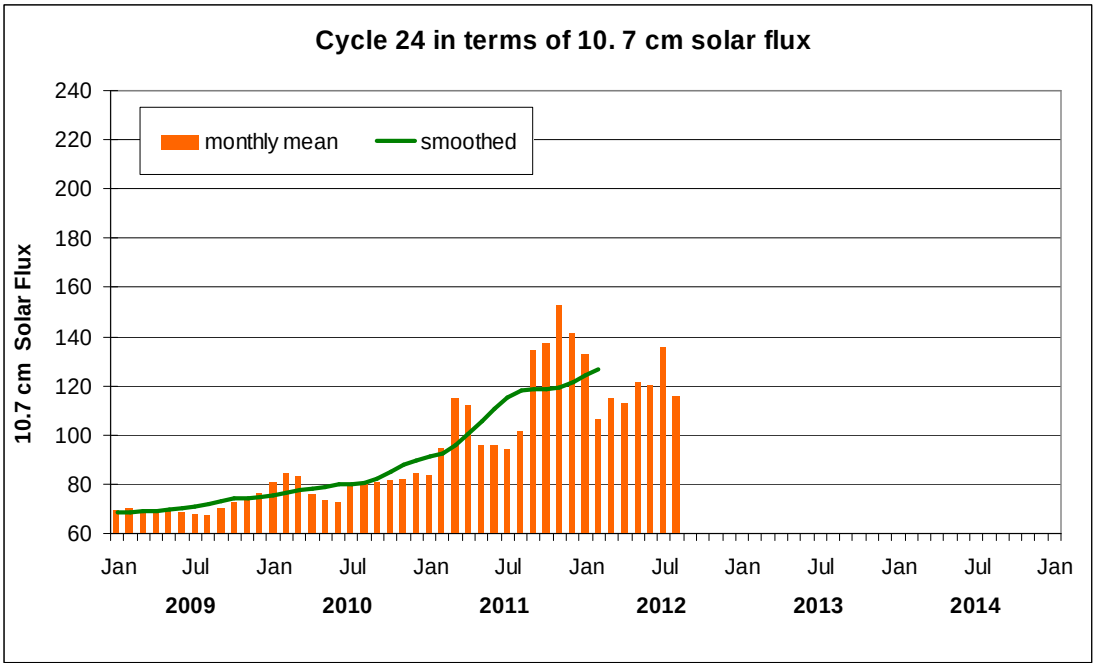

Figure 1 – 10.7 cm Solar Flux Data for Cycle 24

Note that the Fall of 2011 does not show a peak in the smoothed 10.7 cm solar flux. It does show a leveling off of the smoothed 10.7 cm solar flux for several months, but then the smoothed 10.7 cm solar flux continued its ascent (hopefully it will keep going up for a while!).

So what really happened in the Fall of 2011? The monthly mean data (the orange vertical bars) tells the story. The months in the Fall of 2011 showed a significant increase in solar activity. And with the Fall months giving the highest maximum usable frequencies (MUFs) in the Northern hemisphere, worldwide propagation on 10-Meters was extremely good as noted in the first paragraph.

But then solar activity in the Spring of 2012 waned as seen in the monthly mean data. These months give MUFs that are less than the Fall months when the smoothed value is essentially constant. The result of this was 10-Meters being open mostly on just north-south paths – and hence fewer QSOs.

Historically a peak in a solar cycle is followed by a pronounced dip in the smoothed index. Figure 2 shows Cycle 23 in terms of the 10.7 cm solar flux.

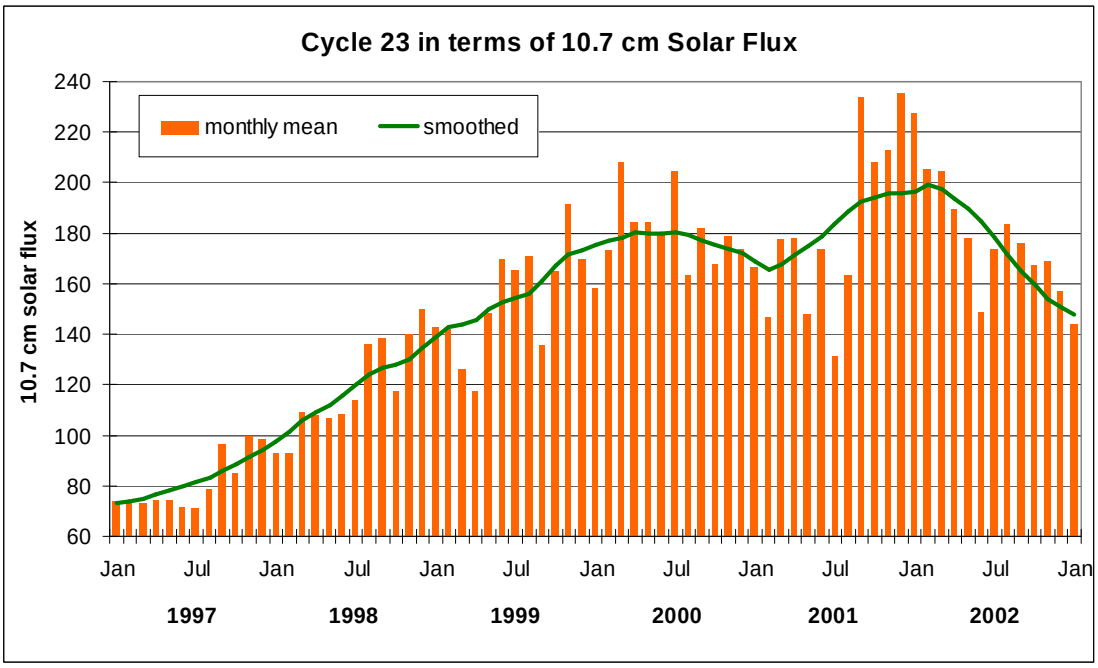

Figure 2 - 10.7 cm Solar Flux Data for Cycle 23

The dip in the smoothed index (the green line) after the first peak is very obvious. Note that the Cycle 23 smoothed data also had several small leveling offs (for example, around March 1999) as we see in Cycle 24 – but they weren't as pronounced as in Cycle 24. These leveling offs are a typical characteristic of a solar cycle's ascent.

Figure 2 shows that Cycle 23 had two peaks. Figure 3 shows Cycles 19, 20, 21, 22, and 23.

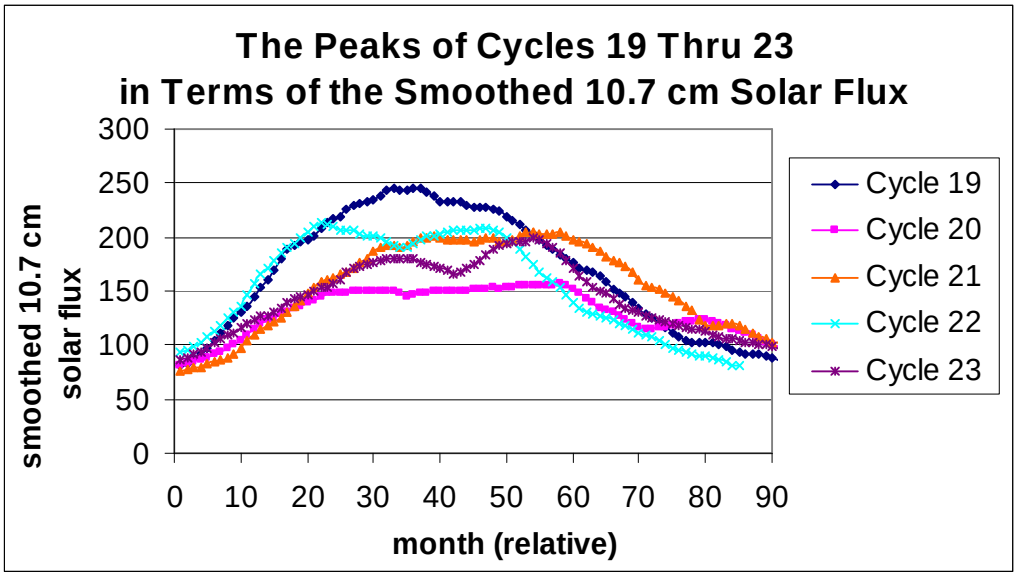

Figure 3 – Peaks of Previous Cycles

Cycle 22 also showed a definite second peak. The other Cycles (19, 20, and 21) didn't exhibit obvious second peaks.

In summary, Cycle 24 hasn't yet showed a peak. And whether it will have a second peak is anyone's guess at the moment.