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ARLP014 Propagation de K7RA

ZCZC AP14
QST de W1AW
Propagation Forecast Bulletin 14 ARLP014
>From Tad Cook, K7RA
Seattle, WA April 4, 2014
To all radio amateurs

SB PROP ARL ARLP014
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Average daily sunspot numbers declined over the past reporting week (March 27 to April 2) from 135.6 to 130.4, compared to the previous seven days. Likewise, average daily solar flux drifted lower, from 153.2 to 149.

The current prediction (from USAF/NOAA on April 3) has solar flux at 155 on April 4, 160 on April 5-8, 150 on April 9-10, 140 on April 11, 135 on April 12-13, then 140 and 145 on April 14-15, 150 on April 16-18, 155 on April 19-22, 145 on April 23-28, 140 on April 29 through May 2, 135 on May 3, and 140 on May 4-8.

Predicted planetary A index is 14, 20 and 8 on April 4-6, 5 on April 7-16, 8 on April 17-19, 5 on April 20-22, 8 on April 23-26, 5 on April 27 through May 2, then 8 on May 3-4, 5 on May 5, and 8 on May 6.

OK1HH gives us his weekly prediction for geomagnetic conditions, as well as observations about this solar cycle peak.

Geomagnetic conditions are expected to be quiet to active April 4, active to disturbed April 5, quiet to unsettled April 6, quiet on April 7, mostly quiet April 8-9, quiet to unsettled April 10-11, quiet on April 12, quiet to unsettled April 13, mostly quiet April 14-15, quiet on April 16, quiet to active April 17, mostly quiet April 18-19, quiet to active April 20-21, and back to quiet on April 22.

He expects an increase in solar wind on April 4-5, again on April 8 and 11, although less certain, then again on April 13-14, and April 20-21. He says the reliability of predictions is temporarily reduced because of significant changes in the configuration of active regions, which is not unusual at the cycle peak.

OK1HH believes we are experiencing the solar cycle's second maximum at present, probably a bit higher than the primary one, and I agree with him, based on tracking a 3-month moving average of daily sunspot numbers.

The Australian government's IPS Radio and Space Services issued a geomagnetic disturbance warning at 0445 UTC on April 3: "Active region 12027 produced a M6.5 X-ray flare with associated CME on 02 April. Possible Active to Minor Storm conditions at higher latitudes on 05 April due to CME arrival. INCREASED GEOMAGNETIC ACTIVITY EXPECTED DUE TO CORONAL MASS EJECTION FOR 05 APRIL 2014."

Randy Crews, W7TJ wrote: "Solar Flux Average for March was approximately 150, down from February's high of 170. Solar flux

averaged 155 for the past 5 Months. The bands have not been this good since 2002 - what a difference! 12 meters has been the real surprise, open world wide most days and well into the evening. The original forecast of a peak in late 2013 was correct, however it has now extended into 2014, the second peak being higher than the first peak in November of 2011. We'll take it!"

Looking at our 3-month moving average of daily sunspot numbers, I am seeing several peaks, and a recent steady increase. First of all, the average sunspot number for January, February and March 2014 was 146.4, the highest since the three months centered on December 2002, which was 151.5.

I see a 3-month moving average peak of daily sunspot numbers at 118.8 and 118.6 centered on October/November 2011, average daily sunspot number for all of 2012 was only 82.3, then we have another 3-month moving average peak centered on April/May 2013 at 106.4 for both periods, and since then it has been 97.5, 85.6, 77.4, 91.2, 102.9, 123.7, 123.3, 138.5 and 146.4.

On Saturday, March 29, Spaceweather.com reported that "Sunspot AR2017 in the Sun's northern hemisphere is crackling with M-class solar flares, and it has a delta-class magnetic field that harbors energy for even stronger eruptions. Earth-directed flares are possible this weekend." Then they reported, "AR2017 has just unleashed an X1-class solar flare. NASA's Solar Dynamics Observatory captured the extreme ultraviolet flash on March 29th at 1752 UTC."

We heard from Angel Santana, WP3GW of Trujillo Alto, Puerto Rico about this event: "I took a break from CQ WPX and was speaking to my mom, when I noticed that the station calling CQ on 10 meters before 1800 UTC shut up abruptly and the S-meter went half meter. I looked in awe and when changed bands, heard the same noise, and said to my mom, 'Oh my, the signals fell! Maybe a solar explosion of some sort!' In less than 5 minutes the bands were alive again."

Interesting, because there wasn't any huge geomagnetic disturbance on March 29, according to http://www.swpc.noaa.gov/ftpdir/latest/DGD.txt but apparently this flash of energy from our Sun caused a short lived shortwave blackout. Anyone else notice this?

Sure enough, the blackout was reported in Africa. Check the site http://newstonight.co.za/content/scientists-witness-powerful-x1-class-flare-sunspot-ar2017-march-29
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CBS News noted it also: http://www.cbsnews.com/news/major-solar-flare-erupts-from-the-sun/ .

We also received a fascinating and detailed report about the event from Raydel, CM2ESP in Havana, Cuba. Raydel says, "This last Saturday March 29, at 1744 UTC I was at home recording APT satellite imagery from NOAA-19 on 137.1 MHz with a RTL-SDR dongle, a simple QFH antenna and a 25 dB pre-amp.

"A couple of minutes into the pass I noticed a deep decrease in the satellite signal to noise ratio which degraded the received picture quality.

"After checking SDR spectrum [a spectrum analyzer, see http://hackaday.com/2013/09/09/an-rtl-sdr-spectrum-analyzer/ - Ed.] I noticed the decrease was due to a high noise and not because the

satellite signal was lower. The noise signature didn't show the common details of 60 Hz AC or the impulsive nature of an internal combustion engine. A little bit baffled I just continued and paid no more attention to it.

"15 minutes later I checked e-mail and to my surprise there was an alert issued by NOAA's SWPC regarding a high X-Ray event! Could the noise on 137.100 MHz be related to it?

"After checking the X-Ray plot I noticed it was an X1.0 event, a nice and strong one!

"So, I applied a notch filter to remove the satellite signal from the recorded audio and try to have a more clear idea of the event itself in metric band. Once removed (most of it) the satellite audio from the recording, as the transmission is FM, signal from the satellite should sound as 'quiet' and the solar radio emission should produce an increase in the noise.

"That's not perfect at all, but it is just a method in order to extract some information from the recording. There was no way to know such event would happen that moment, and it was no more than an amazing coincidence.

"So, if life gives you lemons, let's make lemonade! OK, So after replaying the filtered audio and with help of Radio SkyPipe, some insights about the event can be seen.

"Interesting is also that the ionosonde station at Havana, Cuba, which is just a few miles from my home also recorded a huge absorption, that almost 'cleaned' the ionogram. According to NOAA the peak flux at 245 MHz was 110,000 units!"

Great report from Cuba, and be sure to check the page for CM2ESP on QRZ.com to see more details about his station, including an East German transceiver he salvaged and put on the air.

Jon Jones, N0JK reports that at 1051 UTC on March 30 he made the first long path 6 meter QSO for Cycle 24 from KH6 to Europe. He was running 100 watts to a dipole at 120 feet on the southwest side of Oahu, and worked S57RR in Slovenia. Art, KH6SX made the next long path QSO with S57RR followed by a QSO with Bruno, IS0GQX in Sardinia.

Kerry Rochester, G8VR reports, "The first G to KH6 via long path (the only path) was 27 March 2000 at 1057 UTC. There were at least two further openings around a year later."

On March 24 Kerry had written to Jon, noting, "Look out for LP openings to EU over the South Pole. These have happened right at the time you are going. Time frame 1000-1200 UTC. I don't expect it will come as far North as us, but you might get EA."

We also heard from Fred, KH7Y on March 31: "GM Tad, we had long path last night to Europe on 50 MHz. I worked 19 stations in I, IS, 9A and S57. Signals were strong at times with TEP flutter. At the same time as the long path opening we had KH9, V73, FK8 beacons in plus the BY TV on 49.75 MHz very strong. KH6SX and N0JK/KH6 also made contacts.

"The opening lasted about 50 minutes, started about 1032 UTC that is 1232 HST here."

Mike Babb, N4PF of Cynthiana, Kentucky wrote about more 10 meter fun: "I'm pretty excited about a QSO I made during the CQ WPX SSB contest this past weekend. On 3/29/2014 at 2043 UTC I worked T32AZ in East Kiribati with my KX3 using only 12 watts into a Carolina Windom. Ken was only about 4x5 with some QSB on my end. He had some difficulty pulling out my call, but we made the contact, and my day! To say 10 meters was hot is an understatement!"

HC5K reported: "Yesterday for the first time in years we had here in Ecuador a sudden 50 MHz opening at 1800 thru 2100 UTC on south-north-south direction (TEP) with heavy activity toward the southeastern USA.

"There were two stations locally, HC5CR and myself, HC5K spaced about 15 KHz and we worked about 165 stations and about 65 Grid Locator areas, with average signal levels for HC5CR with his new 6 element 6 meter Boom antenna at 25 meters. His rx and tx reports 99 percent over S-9 plus. During highest peak he checked with his new 13 element, 8 meter boom VHF at 144.300 and 200-250, but no opening occurred. Caribbean stations and Paraguay, Uruguay, Chile and Argentina reported lots of trans-equatorial propagation effects. But nothing here in the equatorial country of Ecuador. My test station is an HF dipole and 50 watts. Receiver levels average S 8-9 all the time."

At the last minute (1241 UTC Friday) KH7Y reported: "OK Tad just heading off to bed. It is about 2:00 AM. Worked LZ2WO (Bulgaria) and LZ2HM at 1030 UTC long path on 50.090 MHz. CW signals built to 579. No other countries, just LZ. Many of my SV, I, SP and 9A friends were listening, and heard nothing but LZ."

If you would like to make a comment or have a tip for our readers, email the author at, k7ra@arrl.net.

For more information concerning radio propagation, see the ARRL Technical Information Service web page at http://arrl.org/propagation-of-rf-signals. For an explanation of the numbers used in this bulletin, see http://arrl.org/the-sun-the-earth-the-ionosphere. An archive of past propagation bulletins is at http://arrl.org/w1aw-bulletins-archive-propagation. More good information and tutorials on propagation are at http://k9la.us/.

Monthly propagation charts between four USA regions and twelve overseas locations are at http://arrl.org/propagation.

Instructions for starting or ending email distribution of ARRL bulletins are at http://arrl.org/bulletins.

Sunspot numbers for March 27 through April 2 were 145, 135, 132, 122, 129, 124, and 126, with a mean of 130.4. 10.7 cm flux was 144.8, 146.4, 142.7, 148.4, 152.4, 153.3, and 154.7, with a mean of 149. Estimated planetary A indices were 7, 8, 8, 5, 7, 6, and 5, with a mean of 6.6. Estimated mid-latitude A indices were 7, 9, 9, 5, 8, 5, and 6, with a mean of 7.
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