HEUS 1 BOU 141300
FROM SPACE ENVIRONMENT SERVICES CENTER, BOULDER, COLORADO
SDF NUMBER 287A
JOINT USAF/NOAA REPORT OF SOLAR AND GEOPHYSICAL ACTIVITY
ISSUED 1300Z 14 OCTOBER 1981
1A. ANALYSIS OF SOLAR ACTIVE REGIONS AND ACTIVITY FROM
.3/1200Z TO 14/1200Z:
SOLAR ACTIVITY HAS BEEN MODERATE. TWO GREAT ACTIVE REGIONS DOMINATE THE SOLAR DISK. REGION 3390-3397 (S19W04) PRODUCED SMALL CLASS M EVENTS AT 1823ZN 2304Z AND 0424Z. PROPER MOTIONS AND MINOR GROWTH AMONG ITS MANY SUNSPOTS ARE REPORTED, WITH DIVERGENCE BETWEEN THE LARGEST SPOTS OF OPPOSITE POLARITY. ACTIVE ASSOCIATED FILAMENTS AND RAPID PLAGE FLUCTUATIONS GIVE THIS REGION AN OMINOUS APPEARANCE. THIS REGION HAS ALREADY PRODUCED TWO X3 PROTON EVENTS. REGION 3403 (S10E58) IS NEARLY AS LARGE AND BRILLIANT BUT WITH A SMALLER AND LESS COMPACT CLASS F SPOT GROUP. A SMALL CLASS M EVENT OCCURRED HERE AT 2249Z. THE COMPACT AND COMPLEX FORM OF THIS REGION INDICATES POTENTIAL FOR MUCH LARGER EVENTS. FREQUENT SURGES ACCOMPANY EAST LIMB PASSAGE OF REGION 3406 (S09E80), WHICH SO FAR SHOWS THREE STRONG BUT SMALL SPOTS. MINOR SURGES MARK SMALL REGIONS AT N08 AND N18 EAST LIMB. REGION 3405 (S09E10) HAS FORMED A SMALL BUT PECULIAR SPOT GROUP NEAR THE NE BOUNDARY OF THE GREAT PROTON-FLARE-REGION (3390). MINOR GROWTH HAS OCCURRED IN REGION 3401 (N19W47). REGION 3388 (S09) IS CROSSING WEST LIMB WITH A MUCH DIMINISHED SPOT GROUP.
1B. SOLAR ACTIVITY FORECAST:
ANOTHER CLASS X PROTON FLARE IS IMMINENT FROM REGION 3390. CLASS M EVENT ARE EXPECTED FREQUENTLY FROM THE TWO MAJOR ACTIVE CENTERS. DECAY OF REGION 3390-3397 IS EXPECTED FOLLOWING ITS NEXT MAJOR EVENT, LEADING TO A DECLINE IN SOLAR INDICES.
II. GEOPHYSICAL SUMMARY AND FORECAST:
A MAJOR GEOMAGNETIC STORM BEGAN WITH A SUDDEN COMMENCEMENT AT 2241Z, 23 MINUTES AFTER A SHOCK OBSERVED ON ISEE-3 SPACECRAFT. K-VALUES OF 6, 7 WERE OBSERVED FOR 00-03Z, 03-06Z. UNSETTLED CONDITIONS HAVE PREVAILED SINCE 06Z, BUT THE MAGNETIC VARIATIONS HAVE HIGH FREQUENCY TYPICAL OF ACTIVE CONDITIONS. AN OCCURRENCE OF SEVERE ACTIVITY IS EXPECTED IN THE NEXT 6 HOURS. STORM CONDITIONS ARE EXPECTED TO INTENSIFY ON 15 OCTOBER, THEN SUBSIDE DURING THE NEXT 48 HOURS. ANOTHER PROTON FLARE IS EXPECTED TO PRODUCE ANOTHER MAJOR GEOMAGNETIC STORM BEFORE THE END OF THE THIRD DAY. THE SATELLITE PROTON EVENT PEAKED AT 2247Z WITH THE GEOMAGNETIC SUDDEN COMMENCEMENT, REACHING A FLUX OF 2000 PARTICLES/SEC/CM2/STER AT GT 10 MEV. THE FLUX HAS SINCE DECLINED TO 450 BY 1200Z. THE PROTON EVENT IS EXPECTED TO CONTINUE FOR ANOTHER 36-48 HOURS EVEN WITHOUT ANOTHER PROTON FLARE.
III. EVENT PROBABILITIES: 15 - 17 OCTOBER
CLASS M 90/90/90
CLASS X 40/40/40
PROTON 40/40/40
PCAF IN PROGRESS
IV. OTTAWA 10.7 FLUX
OBSERVED 13 OCT 244
ESTIMATED 14 OCT 258
PREDICTED 15-17 OCT 262/250/240
90 DAY MEAN 13 OCT 218
V. GEOMAGNETIC A INDICES)
OBSERVED AFR 12 OCT 12 AP 13 OCT 13
ESTIMATED AFR 13 OCT 09 AFR/AP 14 OCT 40/50
PREDICTED AFR/AP 15-17 OCT 40/50 25/25 30/15
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ISSUED 2200Z 14 OCTOBER 1981
IA. ANALYSIS OF SOLAR ACTIVE REGIONS AND ACTIVITY FROM 14/1200Z TO 14/2100Z: SOLAR ACTIVITY HAS BEEN HIGH DURING THE PAST 9 HOURS. REGION 3406 (S10E77), WHICH WAS NUMBERED TODAY, PRODUCED AN X3/SB FLARE BEGINNING AT 14/1705Z. THIS FLARE WAS ACCOMPANIED BY STRONG SHORTWAVE FADES TO 15 MHZ AND MODERATE MICRO WAVE RADIO NOISE BURSTS AT MOST FREQUENCIES MONITORED. REGION 3403 (S11E52) PRODUCE AN M1/1B FLARE AT 1439Z AND A C9/2B FLARE AT 1645Z. THESE FLARES WERE ACCOMPANIED BY SOMEWHAT SMALLER MICRO WAVE BURSTS THAN SEEN WITH THE X3 EVENT. REGION 3390 (S18W07) HAS ONLY MANAGED TO PRODUCE A FEW SMALL C-CLASS SUBFLARES IN THE PAST 9 HOURS. NEW REGIONS 3407 (S18W30) AND 3408 (N14E71) WERE ALSO NUMBERED TODAY.
IB. SOLAR ACTIVITY FORECAST: SOLAR ACTIVITY IS EXPECTED TO BE GENERALLY MODERATE WITH ISOLATED MAJOR FLARES NOW POSSIBLE FROM REGIONS 3390, 3403 AND 3406. ALTHOUGH PRESENTLY QUIET, REGION 3390 APPEARS CAPABLE OF AN EXTREMELY ENERGETIC EVENT AND IT IS NOW POSITIONED SO THAT A BIG FLARE THERE WILL HAVE MAXIMUM GEOPHYSICAL EFFECT.
II. GEOPHYSICAL SUMMARY AND FORECAST: THE GEOMAGNETIC FIELD HAS BEEN UNSETTLED DURING THE PAST 9 HOURS. ALTHOUGH K-VALUES HAVE BEEN LOW, THERE IS EVIDENCE OF WELL-ESTABLISHED RING CURRENT AND A SOUTHWARD SHIFT IN THE BZ-COMPONENT COULD HERALD AN ADDITIONAL STORM PERIOD. GEOMAGNETIC CONDITIONS ARE EXPECTED TO BE AT MINOR GEOMAGNETIC STORM LEVELS DURING THE NEXT 9 TO 12 HOURS WITH ACTIVITY SUBSIDING AFTER THAT. THE SATELLITE PROTON EVENT HAS DIMINISHED TO 162 PARTICLES/CM2/SEC/STER AS OF THIS REPORT (A VALUE STILL WELL ABOVE EVENT THRESHOLDS OF 10 PARTICLES/SEC). THULE 30 MHZ RIOMETER READINGS ARE AT 4.2 DB DAYTIME (STILL ABOVE PCA THRESHOLDS OF 2.0 DB DAYTIME). THE PROTON EVENT IS EXPECTED TO CONTINUE ANOTHER 12 HOURS EVEN WITHOUT ANOTHER PROTON FLARE.
III. EVENT PROBABILITIES 15 OCTOBER - 17 OCTOBER

CLASS M	90/90/90
CLASS X	40/40/40
PROTON	40/40/40
PCA	IN PROGRESS

IV. OTTAWA 10.7 CM FLUX

OBSERVED	14 OCTOBER	277
PREDICTED	15-17 OCTOBER	282/287/288
90-DAY MEAN	14 OCTOBER	219

V. GEOMAGNETIC A INDICES

OBSERVED AFR/AP	13 OCTOBER	13/13
ESTIMATED AFR/AP	14 OCTOBER	30/50
PREDICTED AFR/AP	15-17 OCTOBER	28/40 - 25/25 - 30/15

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