great flexibility in the SOLEX operations. For example, scan endpoint wavelengths are selectable so that high time resolution over a short wavelength range can be chosen. In the raster mode, maps may be made at any wavelength within the appropriate spectrometer’s wavelength range. We will describe the SOLEX instrumentation in detail. This work was supported by the U. S. Air Force Space and Missiles Systems Organization Contract No. F04701-78-C-0079.

06.20.03 Type I Solar Radio Bursts. A. O. BERN and D. G. WINTZEL, Federal Institute of Technology, Zurich.* — The short time duration of type I bursts indicates a source size of only a few 10^3 km. Assuming emission near the plasma frequency, because of the observed total circular polarization, and the corresponding absorption, one derives a source brightness temperature of order 10^14 K. This high value, and the association of the bursts with developing active regions and high radar reflectivity at decimeter wavelengths, suggests that type I bursts may be the sites of plasma waves and anomalous current dissipation. We investigate the radio emission from interacting plasma (Langmuir) and ion sound waves. A reasonable choice kL = 0.1 yields the observed 0-mode polarization. The ion sound waves determine the optical depth. A source only a few km wide is optically thick. The plasma waves control the brightness temperature. When the two sets of waves travel in nearly opposite directions, wave energy density needs to be of the order of 10^4 thermal, consistent with the absence of second-harmonic emission. Nonthermal electrons associated with the waves may explain the type I continuum. * DGM also at Univ. of Md., with support from the NSF Atmospheric Research Section.

07.20.03 Evolution of the Decameter Wavelength Spectrum of the Quiet Sun. P.E. GERGELY, Astronomy Program, University of Maryland, College Park. The Teepee Fair array of the Clark Lake Radio Observatory has been used to compare the flux of the quiet Sun with that of a few strong solar radio sources in the frequency range 110.0-20.0 Mhz. The observations were taken at times when the Sun and the comparison source were at the same declination, thus eliminating the need for a gain vs. zenith distance correction. Our measurements cover a time period of approximately two years, starting in July 1976. We discuss the evolution of the spectrum of the quiet Sun within our frequency range over this ascending part of the solar cycle.

08.20.03 Very Large Array Observations of Solar Active Regions. K. R. LAND URST, Univ. of Maryland. High resolution radio wavelength observations of solar active regions indicate that present, small scale features (≤20") whose high degree of circular polarization (≤40%) reflects the magnetic field structure of the solar corona. Very Large Array (VLA) maps of active regions at 6 cm wavelength are presented for both left hand (L.C.P.) and right hand (R.C.P.) circularly polarized radiation. The small-scale L.C.P. and R.C.P. features are not spatially coincident, suggesting the feet of magnetic dipoles fields with positive magnetic polarity corresponding to regions of strong right hand circular polarization. This is confirmed by comparison with optical wavelength magnetograms taken at K.P.N.O. The high brightness temperatures (≥10^7K) of the radio wavelength features suggest a coronal origin, whereas the optical wavelength features refer to the lower, lying photosphere. Both the V.L.A. maps of the coronal magnetic field and the magnetograms of the photospheric magnetic field have comparable angular resolutions of a few seconds of arc. Coronal magnetic field strengths of a few hundred gauss are inferred under the assumption that the radio wavelength radiation is emitted at the first few harmonics of the gyrofrequency.

09.20.03 Heavy Ions and Helium in the Solar Wind. K.W. ONWUPURU, Goddard Space Flight Center, Greenbelt. Recent observations of heavy ions and the He/H ratio by the ion composition experiment on TiME-3 will be discussed, with special emphasis on He/H variations with time and on the temperature of the heavy ions.

10.20.03 Pitch Angle Scattering of Solar Energetic Particles: New Information from Helios. J.A. EARL, J.W. BIEBER, Univ. of Maryland, College Park, MD 20742; G. GREEN, H. KUNOW, H. MILLER-MELLIN, G. WIBERGEN, Univ. of Kiel, 2300 Kiel, W. Germany — Solar particle data at 0.5 AU from the Kiel experiment on Helios 2 were compared with the predictions of a theoretical model which takes into account all significant aspects of the longitudinal transport of energetic particles along interplanetary magnetic fields and which also includes the effect of a postulated temporal profile of injection. During an event on 28 March 1976, a good correspondence between observations and predictions was obtained for 4-13 MeV protons and for 0.3 - 0.8 MeV electrons. For both species, the mean free path was 0.7 AU, independent of rigidity. Throughout this nearly coherent event, strongly anisotropic pitch angle distributions were accurately described by this model, provided that the rate of pitch angle scattering was assumed to go through a local minimum centered at 90° pitch angle.