

a magnetic storm day². But during the current eclipse observations the PS were seen on every night except

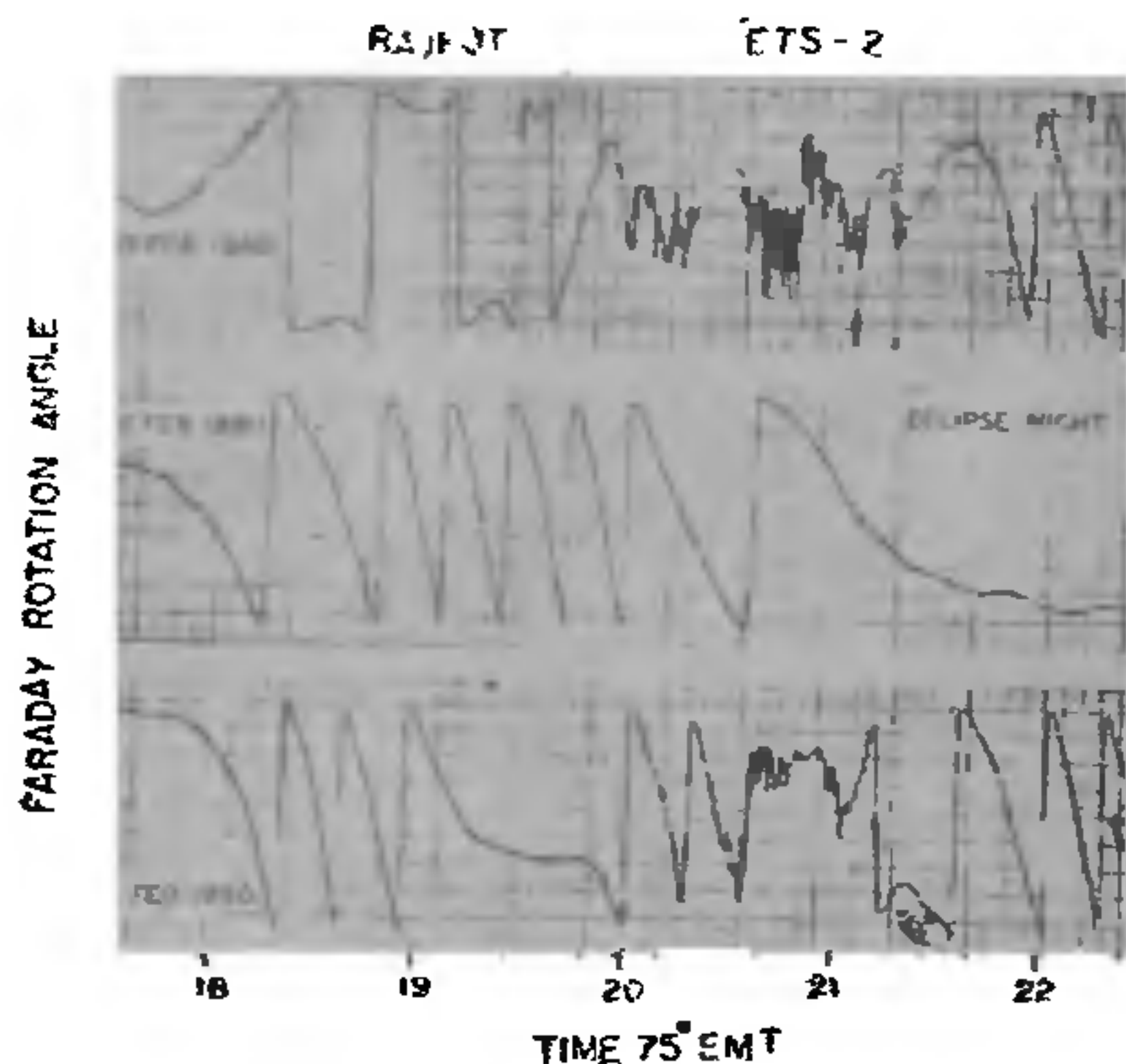


FIG. 1. Records of Faraday rotation at 130 MHz radio beacon from satellite ETS-2 at Rajkot on nights of 15 February, 16 February (eclipse day) and 17 February 1980. No polarization scintillations were observed on the night of 16 February.

the eclipse night. A moderate magnetic storm with sudden commencement began at 0810 75° EMT on 14th February 1980 with magnetic field recovery near 0000 hr on 15th February 1980. A major magnetic storm on 16th February began after 0000 hr with field recovery near 2100 hr on the same day. So the absence of scintillations on the eclipse night (16th February, 1980) is probably due to magnetic storm. The night-time scintillations are present whenever there is spread-F. A study of the magnetic activity dependence of spread-F occurrence at Kodaikanal (Chandra and Vyas³) has shown that the magnetic activity inhibits spread-F during D and E months of high sunspot years but during low sunspot years there could be increase in spread-F occurrence. This may be the reason that while during 1976 there was PS following a magnetic storm it was inhibited during 1980. However, it is important that during the entire two weeks of observations PS were observed which gives a clear indication that PS are observed during high sunspot years.

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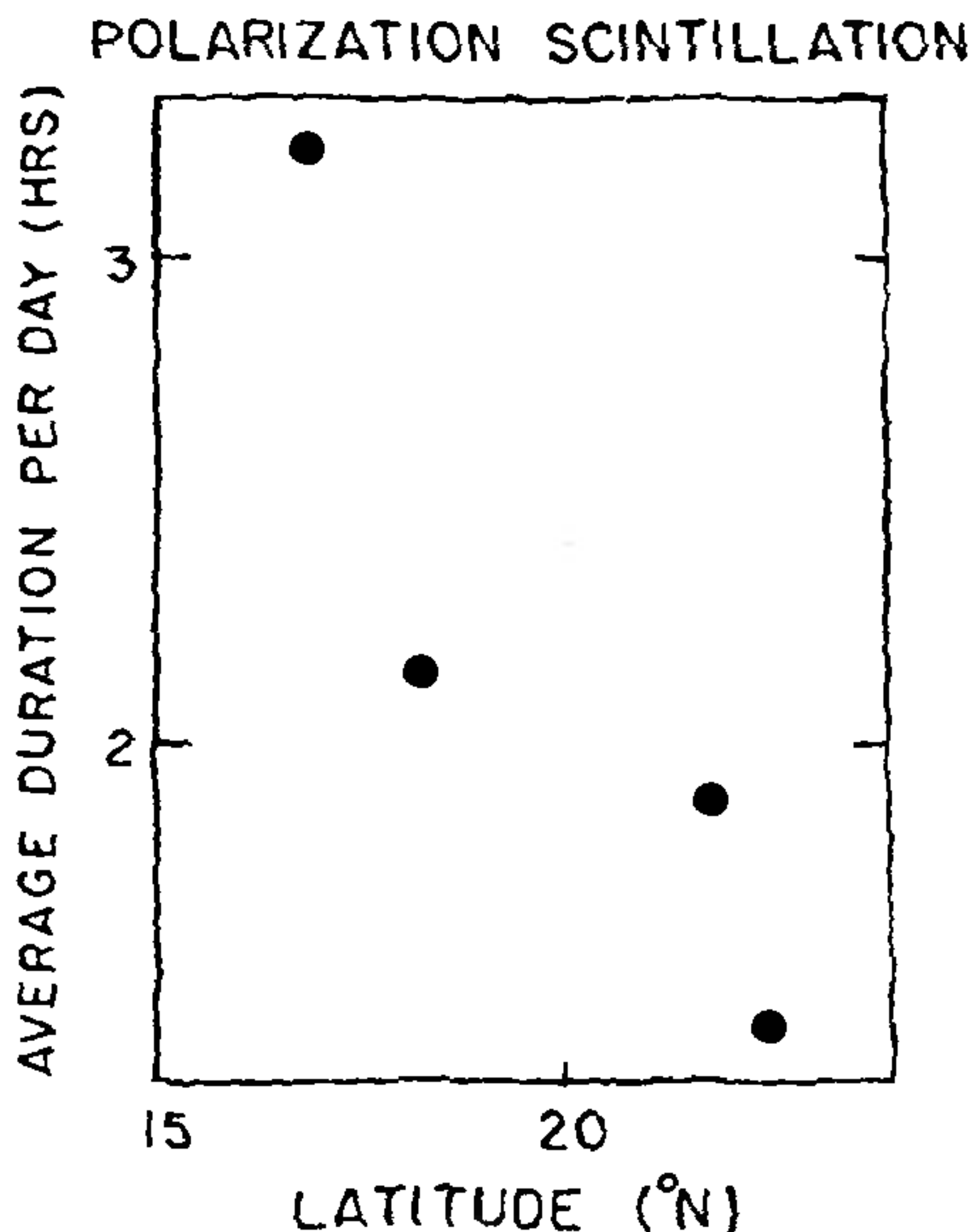


FIG. 2. Latitudinal variation of the average duration of polarization scintillation based on records from a chain of stations operated during the eclipse campaign.

LOW ENERGY AUGER ELECTRON SPECTRA FROM Mg AND MgO WITH A RETARDING FIELD ANALYSER

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AUGER electrons are ejected out of an atom by a non-radiative process which occurs when the atom is ionized by a primary electron beam. The Auger electrons, which can also be referred as the secondary electrons, are separated according to their energy by different methods. One of the methods applied in the Auger electron analysis is by means of a retarding field ana-

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lyser based on LEED optics configuration. In our Research Centre, an Auger spectrometer has been built, using the retarding grid analyser for the electron energy analysis. Details of construction of the spectrometer have been previously reported¹. In this communication, we report some of the results obtained for Mg-metal and MgO samples.

The magnesium metal sample, in the form of a strip, was mounted on a copper plate. The MgO sample was prepared in the form of a pellet. A primary electron beam, from an electron gun, having an energy 1 keV and a current of 2 micromperes was used to induce Auger electron emission from the metal and its oxide. A peak to peak modulation of 5 volts was employed. In Fig. 1, the low energy spectra obtained for both Mg-metal and MgO are shown. In both cases, there are three prominent peaks, marked 1, 2, 3 for metal and 4, 5, 6 for oxide. The peak energies and their transitions are given in Table I. In the case of metal, peak '2' (energy = 45 eV) corresponds to $L_{2,3}-VV$ transition. Out of the three peaks, this peak should have been most intense. The peak '3' (energy = 58 eV) appears most intense because of interference from Auger electrons with the same energy, resulting from the copper plate on which the metal was mounted. The peak at 34 eV (peak '1' in Fig. 1) arises due to a bulk plasmon loss as well as due to MgO layer formed on the metal. In the case of MgO (Fig. 1b) the most intense peak occurs at an energy of 34 eV (peak '4') and corresponds to $Mg^{2+} L_{2,3} O^{2-} L_{2,3} O^{2-} L_{2,3}$ transition.

The results (Table I) provide with one important piece of information, viz., that the low energy Auger spectra could also be used to know the chemical state of an element. The most intense peak, in the case of Mg-metal, occurs at 45 eV, involving a core level and two valence levels of Mg-atom in the transition. However, in the case of MgO, the most intense peak is seen at 34 eV, involving a core level of Mg-atom and two core levels of oxygen. Our results also demonstrate clearly

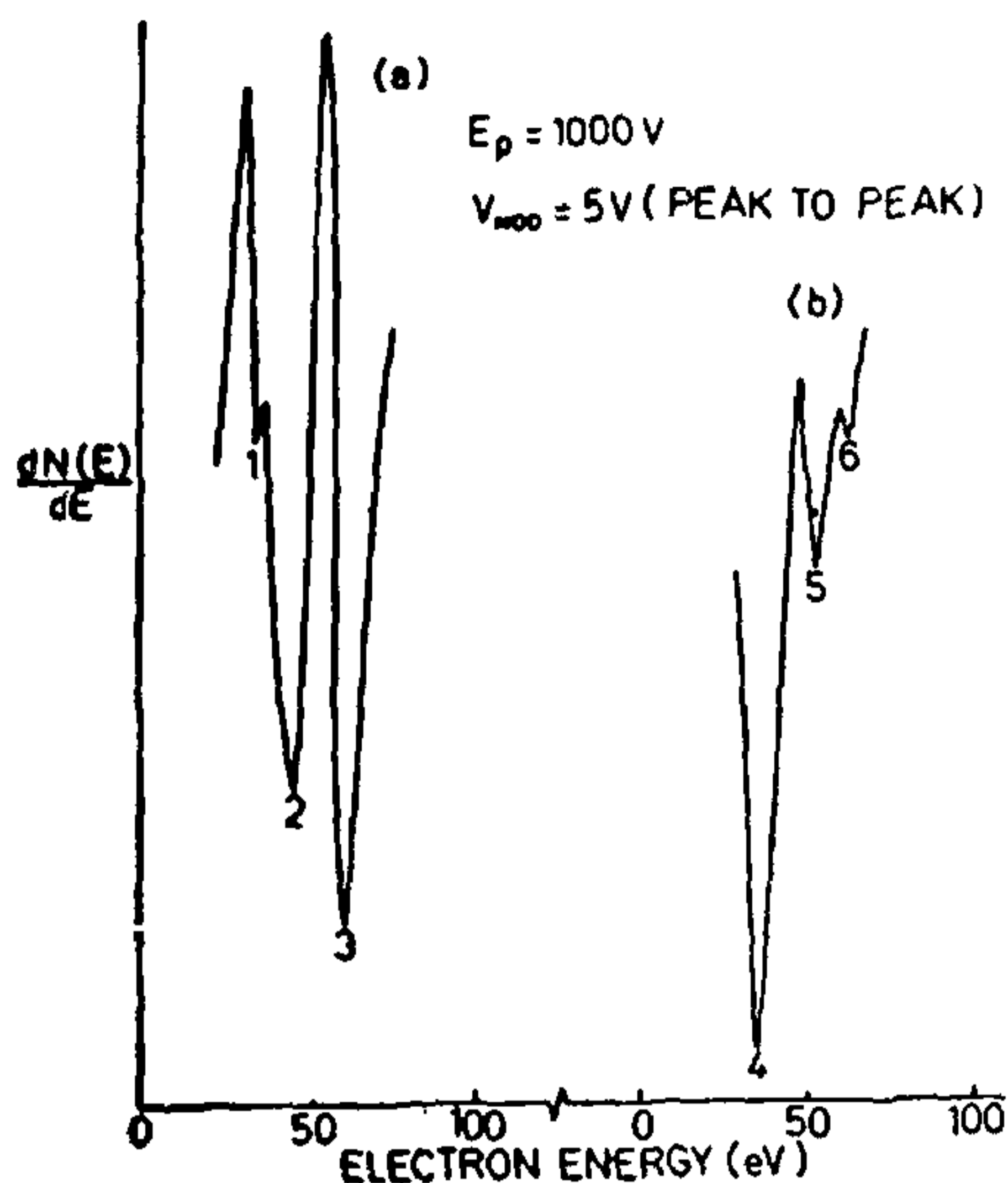


FIG. 1. Low energy Auger spectra of (a) Mg-metal and (b) MgO.

that the resolution of the indigenously built spectrometer is comparable to that obtained with some of the commercial Auger spectrometers.

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TABLE I
Observed Auger electron energies

Peak No.*	Energy (eV)	Transition ²
1	34	$Mg^{2+} L_{2,3} O^{2-} L_{2,3} O^{2-} L_{2,3} +$ bulk plasmon
2	45	$Mg L_{2,3} - VV$
3	58	$Mg L_{2,3} - VV$
4	34	$Mg^{2+} L_{2,3} O^{2-} L_{2,3} O^{2-} L_{2,3}$
5	52	$Mg^{2+} L_{2,3} O^{2-} L_{2,3} O^{2-} L_{2,3}$
6	60	$Mg^{2+} L_{1} O^{2-} L_{1} O^{2-} L_{2,3}$

* See Fig. 1 for Peak No.

SYNTHESIS WITH α -PHENYLCINNAMOYL CHLORIDE AND DIAZOALKANES

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1-DIAZO-1-alkyl-2,4-dihydroxybut-3-en-2-one (I) and 3-alkyldiazoacetyl-3,4-dihydroxy-5-alkyl pyrazoline (II) were obtained by the action of 2 and 3 moles of diazoalkanes on 1 mole of α -phenylcinnamoyl chloride.

α -Phenylcinnamoyl chloride contains two sites of reactivity, an acid chloride group and a double bond, towards diazoalkanes. By adopting the method of Arndt, Eistert and Partale^{1,2} the action of 2 moles of diazomethane, diazethane, diazopropane, diazo-