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Ludwig Oster

Yale University Observatory

New Haven, Connecticut

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Practically all results of the work supported by NASA Grant NsG 176-61 have been published or are in the process of publication. Thus, only a very brief summary is given in the following, with reference to the publications that originated under the Grant and that are listed in the Bibliography at the end of this Report.

One major effort concerned the passage of fast charged particles through the coronal plasma; on the basis of an availbale mechanism, a self-consistent analysis of the interaction of test particles with field electrons has been carried out [1]. It has been shown that a resonance at the electron plasma frequency is present which is of the general form required to explain at least the type III radio bursts from the sun [2, 3]. Quantitative applications show that the observed intensities and half-widths of type III bursts can be understood by postulating the passage of quite reasonable numbers of fast particles [4].

It was found that a large number of higher harmonics can be generated if magnetic fields are present [5], but that these magnetic field effects are apparently not the crucial phenomenon in volved in type III radio events. Similarly, a lengthy analysis of relativistic effects showed that no significant changes occur in intensity or spectrum behavior, if the test particle speed approaches the speed of light [6, 7].

Several general problems of the coronal background and of the active sun have been discussed, in particula-, the thermal radio spectrum [8], the correlation behavior of solar activity [9], the emission of fast protons by flares and their effects on the moon [10], and the geo-magnetic effects of plage areas [11].

Several papers were published that dealt with solar flares and thermal instability problems. The conductive behavior has been clarified, both in the presence and in the absence of magnetic fields [12, 13]. Here, and in a detailed investigation of thermal instability of the solar atmosphere, flares were the major application [14]. The influence of magnetic fields was treated, and the results applied to the formation of prominences [15, 16]. Finally, the general formalism was applied to related problems in astrophysics, namely, the stability of the interstellar gas [17], the formation of planetary nebulae [18], of stars in general [19], and of H II regions [20].

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