Abstract. There are three kinds of observations that provide indirect evidence for the contentions that (a) some type III radiation is fundamental radiation; and (b) type III's are at times emitted simultaneously as fundamental and second-harmonic plasma radiation.

Two groups of authors (Daigne (1975a, b) and Daigne and Moller-Pedersen (1975); Mercier and Rosenberg (1974) and Rosenberg (1975)) have queried the existence of fundamental radiation in type III bursts. They interpret what appear to be harmonically related pairs of type III bursts as two bursts radiated at the second harmonic of the plasma frequency: in one case (Rosenberg, 1975) from successive electron streams and in the other (Daigne, 1975b) from the front and body of one electron stream.

The direct evidence for genuine harmonic structure is strong. While some of the most convincing examples have been published more recently (e.g. Stewart, 1975a, b), the examples given in the discovery papers (see, for instance, Figure 1) are quite compelling. It was clear from the beginning that: (a) the recognition of harmonic structure in the 'fast-drift' type III bursts was more difficult than that in the 'slow-drift' type II bursts; and (b) the harmonic ratio was more widely dispersed for type III than for type II bursts. The latter would be expected, since any differential delay ($\leq 1$ s) between fundamental and harmonic radiation would have a substantial effect on the harmonic ratio of bursts drifting from high to low frequencies at rates of $\sim 10$ to $\sim 100$ MHz s$^{-1}$.

There are several observations of type III and associated types of burst that provide interesting indirect evidence for the contentions that (a) some type III radiation is fundamental plasma radiation; and (b) type III radiation is at times emitted simultaneously as fundamental and second-harmonic plasma radiation.

(1) It has long been known (Malville, 1962) that storms of type III bursts tend to adjoin type I bursts at the latter's low-frequency limit. More particularly, type III storm bursts appear to 'grow' out of chains of type I bursts (Hanasz, 1966). Type I bursts are in general strongly ($\sim 100\%$) circularly polarized and radiated specifically in the ordinary magnetoionic mode (o-mode). While an interpretation of type I bursts in terms of coherent, fundamental gyro-radiation has been given (Fung and Yip, 1966), it was shown later (Melrose, 1973) that such radiation would be predominantly in the extraordinary magnetoionic mode (x-mode).
Fig. 1. Early examples of harmonically related pairs of type III bursts recorded with the 40–240 MHz spectrograph at Dapto between October 1952 and June 1953. In the right-hand column the seven burst pairs are replotted with the harmonic bands shifted 2:1 in frequency. The displacement, mostly leftward, of the harmonic bands indicates harmonic ratios <2. (Wild et al., 1954).