Process for Energy Transfer to the Electron Population at Large Distances in Gamma Ray Bubbles\textsuperscript{1} B. BASU, B. COPPI, MIT — Resonant interaction of unmagnetized ions with lower hybrid modes that are excited by the positive slope in the distribution of magnetized electrons serves as a mechanism for transferring the longitudinal energy of electrons to the perpendicular energy of ions. This mechanism, considered originally for the explanation of the enhanced rf emission at $\omega \approx \omega_{ri}$ (ion plasma frequency) and the associated enhanced ion heating observed in Alcator [1], was also proposed by one of us (B. C.) to successfully explain the formation of “ion conics” in the suprathermal region [2]. The inverse process of electron energization due to resonant interaction with lower hybrid modes that are excited by an energetic ion population (e.g. a streaming ion population) could be relevant to the formation of the outer edge region of gamma ray bubbles [3]. We proposed a similar process in 1976, considering lower hybrid modes injected in a confined plasma column as the driver of an electron current [4].


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