[구SE-19] A study of solitary wave trains generated by an injection of a blob into plasmas

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In this study, we investigated the generation of consecutive electrostatic solitary waves (ESWs) using by one-dimensional electrostatic particle-in-cell (PIC) simulation. For a given Gaussian perturbation, it is found that electron two-stream instability occurs in local grids region. Thus because of this instability, the electrostatic potential grows rapidly so as to be separated into electron and ion in perturbation region, and then electrons are trapped with heating during growing instability. It is found that these heated and trapped electrons are caused the generation of ESW, and ions are reflected backward and forward at the boundary of the initial perturbation, then form cold ion beam whereas electrons are confined to inside of the potential. Furthermore backward reflected ion beam forms ion holes by ion two-stream instability. On the other hand, as the confined electrons are released, and then released electrons also form hot electron beam, which play an important role in the generation of consecutive ESWs such as broadband electrostatic noise (BEN) observed frequently in space environment. Therefore the reason of the generation of consecutive ESWs is the existence of heated electrons which can sufficiently support energy to produce ESWs.

[구SE-20] Consideration of CCD Gate Structure in the Determination of the Point Spread Function of Yohkoh Soft X-Ray Telescope (SXT)

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Point Spread Function (PSF) is one of the most important optical characteristics for describing the performance of a telescope. And a concept of subpixelization is inevitable in evaluating the undersampled PSF (Shin and Sakurai 2009). Then, the internal structure of Yohkoh SXT CCD pixel is not uniform: For the top half of pixel area, the X-ray should pass a so-called gate structure where the charges are transferred to an output amplifier. This gate structure shows energy-dependent sensitivity (Tsuneta et al. 1991). For example, for Al-K (8.34 A) X-ray emission, the transmission of the polysilicon gate is about 0.9. Also, for the peak coronal response of the SXT thin filters, around 17 angstrom (0.729 keV), the transmission of the gate is about 0.6, falling off sharply towards longer wavelengths. It should be noted that this spectrally dependent non-uniform response of each CCD pixel will certainly have a noticeable effect on the properties of the PSF at longer wavelengths. Therefore, especially for analyzing the undersampled PSF of low energy source, a careful consideration of non-uniform internal pixel structure is required in determining the shape of the PSF core. The details on the effect of gate structure will be introduced in our presentation.