

Abstract Submitted  
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**Potential profile near the virtual cathode in a dusty plasma device.**<sup>1</sup> DINESH RATHOD, SAROJ KUMAR DASH, ARUN SARMA, VIT UNIVERSITY, CHENNAI CAMPUS — Existence of a virtual cathode in presence of dusty plasma has been studied by theoretical and numerical analysis. Using basic equations of charge dust, ions and electrons, the behavior of the potential in presence of dust has been calculated and plotted as a function of dust density. It was found that there is a change in potential difference between cathode and sheath potential which changes the threshold wall temperature compared to normal plasma condition. The threshold wall temperature has been increased due to the ability of micro-particles acquiring some electron charge and hence, reducing potential at the wall. Further with different values of  $\alpha$  (depends on dust density), threshold temperature remained same for an observed virtual cathode. Hence, behavior of potential was plotted for different  $\alpha$  with increasing wall temperatures. It has been observed that, at lower dust density, double layer like structure is formed near the virtual cathode. Occurrence of two virtual cathodes is observed, one before threshold temperature and one after it. However, irrespective of variation of potential difference near the wall and existence of two virtual cathodes, threshold temperature remained same.

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