

01-012**DEVELOPMENTS OF PLASMA IMMERSION ION IMPLANTATION (PIII) AND DEPOSITION (PIII&D) USING METAL-TUBES**

Ueda, M.(1);

(1) INPE;

Surface of materials or components can be protected by simple painting or by using some more complex chemical or physical processes. Ion implantation is a sophisticated way to produce such protecting layers that can survive in many harsh environments without emission of hazardous residues during processing. Plasma Immersion Ion Implantation (PIII) is the 3-Dimensional counterpart of that ionic technique that has been invented in the late 1980's, and applied to many industrial and scientific components with success. More recently, PIII combined with Deposition (PIII&D) was developed and is being used extensively for many applications in science and technology. Recently, a renewed interest to use PIII for coating of metal tubes has arisen. Massive DLC coating inside metal pipes (many kilometers long) for petroleum extraction in pre-salt basins became a reality thanks to the SWRI group in Texas, USA. Other applications of metal tube PIII are emerging (as using it as fixtures for nitrogen PIII of industrial components) and prospects for using this 3-Dimensional ion implantation method seems to be very bright. In this talk, we will mainly present and discuss the results obtained recently in our PIII group at LAP/INPE, aiming at 3-D ion implantation by PIII and PIII&D processing, in metal tubes.