

Abstract Submitted  
for the DPP09 Meeting of  
The American Physical Society

**Investigation of the Surface Wave Plasma on Cylindrical Dielectric Waveguide**<sup>1</sup> RONGQING LIANG, QIONGRONG OU, XIJIANG CHANG, SHUYU ZHANG, LONG HE, ZEBING LI, Fudan University, DEPARTMENT OF LIGHT SOURCES AND ILLUMINATING ENGINEERING TEAM — The surface wave plasma (SWP) generated by a cylindrical Teflon rod has been developed in our laboratory. A Teflon rod, diameter of 4cm, is adopted to be as waveguide in our experiment. The Microwave frequency is 2.45GHz, and the power is adjustable from about 100W to 800W. The pressure of working gas Argon is set around 20 Pascal. When microwave power is coupled into the cylindrical Teflon rod in a vacuum chamber, a surface wave will be conveyed along the surface of the Teflon rod in axial direction. Plasma could be excited by the electric field of surface wave. Plasma density is proportional with the input microwave power. With increasing density, plasma permittivity will decrease. The variable permittivity of plasma could result in the change of the transmitting mode of surface wave along the Teflon waveguide surrounded by the plasma. The correlative phenomena in our experiment were experimentally observed through the visible light pattern of SWP, and the involved mechanism is theoretically analyzed.

<sup>1</sup>Supported by NNSF of China, No. 10775034.

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Date submitted: 13 Jul 2009

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