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Amorphous Carbon Coatings for Vacuum Chambers of Particle Accelerators and Research on Secondary Electron Yield

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Amorphous carbon (a-C) thin film applied to vacuum chambers of high-energy particle accelerators can decrease secondary electron yield (SEY) and suppress electron-cloud effectively. A dc magnetron sputtering apparatus to obtain a-C film has been designed. With the equipment, a-C thin film can be deposited on the inner face of stainless steel pipes ultimately which is uniform and high-quality. Meanwhile, it is found that a-C has a low SEY < 1.2 measured by the secondary electron emission measurement set-up in the National Synchrotron Radiation Laboratory. The result indicates that a-C is an ideal material for modern accelerators.

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