EF-P013

Shielding Design Parameters for a Fusion Reactor Concept by Using the MCNP and the Tokamak System Analysis Code

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Monte Carlo code and tokamak system analysis code have been used to develop the concepts for a fusion reactor and to classify the design parameters. The system code clearly elucidates the device parameters which satisfy the plasma physics and tokamak engineering constraints in terms of a wide range of plasma physics and technology effects. The result of the system analysis is to identify which areas of the plasma physics and technologies, and to what extent they should be developed for a realization of a given fusion reactor concept. The design of a blanket and a shielding play a key role in determining the size of a reactor since they are the major constraints for various reactor components. In this paper, we coupled a system analysis with a one-dimensional neutronic calculation to determine a reactor parameter in a self-consistent manner. Neutronic optimization by using the Monte Carlo code was performed from the aspects of the tritium breeding ratio, nuclear heating, radiation damage to the toroidal field.

EF-P014

Exhaust Gas Cleaning with Cylinder Type Dielectric Barrier Discharge

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Now a days diesel exhaust emission regulations become strict & intensive. In this experiment engine emission has been investigated with discharge assistance. We have designed π type cylinder with disks with variable size inside as DBD plasma source in order to reduce the NOx content of a diesel engine exhaust and tested it on the similar engine operation modes. It is evident from the experiment that discharge frequency has a crucial impact on equipment performance and gas treatment. The plasma source supply frequency varied from 400Hz to 1.1 KHz and 99% decrease of NO has obtained. The gap between electrodes has been varied to control the length of the discharge area. Four millimeter electrode gap is proved optimal in this configuration gap more than this induced spark and arc discharge and arc can damage the dielectric wall. Four millimeter gap can remove 25% more NO than fourteen millimeter gap.