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Flow Control around Cylinder by HF DBD Discharge IVAN MORALEV, VALENTIN BITYURIN, ANATOLY KLIMOV, PAVEL KAZANSKY, DENIS CHERTOV, JOINT INSTITUTE FOR HIGH TEMPERATURES RAS, MOSCOW TEAM — Control of airflow around a cylindrical model by pulse-repetitive HF discharge ($F_{HF} \sim 350$kHz) is studied at airflow velocity up to 120m/s and Reynolds number Re = $2\text{x}10^4 \div 2\text{x}10^5$. It is obtained that HF pumping higher that the critical one changes airflow around cylindrical model and decreases wake's diameter. Pressure distribution in a model's wake and on the model surface are obtained at different HF discharge power, different duty cycle and different pulse repetitive frequency. Shadow pictures of airflow around a cylinder are obtained. Creation of a secondary large-scaled vortex in the cylinder's wake is recorded in these pictures . Mean discharge power input doesn't exceed 10W/cm, peak HF power doesn't exceed 1 kW. Main parameters of a surface HF discharge are measured. The possible physical mechanism of the surface discharge interaction with airflow in a separation region is discussed in this work.

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