Specialization: 010600 Applied Mathematics and Physics

Master's program: 76 Electrophysics

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**Experimental investigation of the opposite leaders formation in devices with barrier insulation**

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Streamer processes in air are actively investigated and are interesting because they precede the breakdown. One of the receips of increasing the electrorigidity of electrophysical equipment is carrying of solid dielectric barrier into the interelectrode space. This barrier impedes the streamer passing and its fault to the counter-electrode.

The breakdown progress in the system is influenced by peculiarities of streamers interacting with dielectric barrier. Therefore the investigation of the streamers is necessary for the cunstructing of an optimal isolation.

During the literary overview the author considered the general conceptions of streamer processes in the air with the presence of absence of a solid dielectric in the interspace. Also the predecessors' papers about the barrier isolation of the air interspace were studied.

In the work author makes the simulation of a single streamer in the air with the presence of a solid dielectric surface of the active electrode. Also author makes the experimental investigation of streamer processes in the system with dielectric barrier and its influence on the forming of circumflex and opposite leaders.

The author reveals two mechanisms of the interelectrode space breakdown with the presence of dielectric barrier: the circumflex and opposite leaders. The peculiarities of their forming and the dielectric barrier influence on them were described.

The list of publications:

1. *Glushchenko P., Samusenko A., Shipitsina I. and Stishkov Yu.* Computer simulation of negative corona discharge in air // Proceedings of the 7th conference of the French Society of Electrostatics, 2010. P. 268-271.
2. *Самусенко А.В., Стишков Ю.К., Шипицина И.А*. Распространение стримера от электрода с изоляционным покрытием // сборник статей Двенадцатой международной научно-практической конференции “Фундаментальные и прикладные исследования, разработка и применение высоких технологий в промышленности“. 08–10 декабря 2011 года, Санкт-Петербург, Россия / под ред. А.П. Кудинова. – СПб.: Изд-во Политехн. ун-та, 2011. – 438 с.
3. *Самусенко А.В., Стишков Ю.К., Шипицина И.А.*. Влияние плоских диэлектрических барьеров на стримерные процессы и пробой// сборник статей X Международной научной конференции «Современные проблемы электрофизики и  электрогидродинамики жидкостей». 25 июня - 28 июня  2012 года, Санкт-Петербург, Россия.