

Universal micro-particle dynamics in non-uniform electric fields (from liquid to granular jet)

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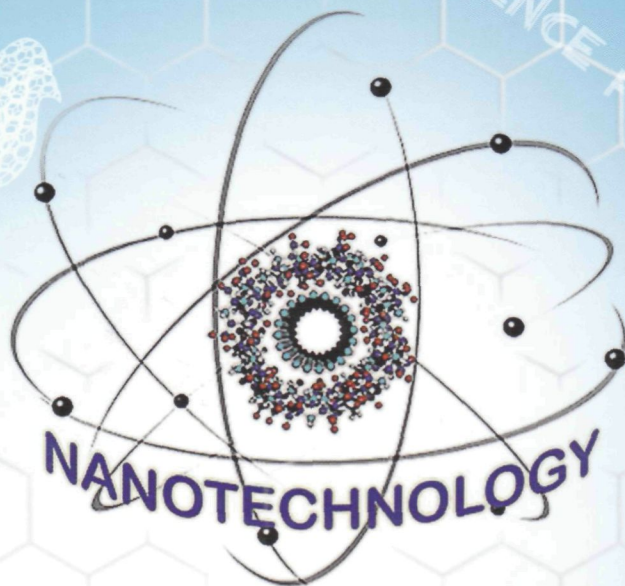
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Experimental tests performed on dry granular systems under non-uniform electric field strongly support that the jet is produced mainly by forces related with polarization mechanisms. A tentative way is proposed for the description of jets from liquid and granular systems within the framework of a unique theoretical approach [1].

It is typical point of view that the formation of electrospray jets is rationalized as produced by columbic forces acting on the charged fluid. It has been shown experimentally [2] that such description is probably formed on unproved assumptions. For example, when maintaining constant potential conditions, it possible to demonstrate that a jet can be, in principle, originated merely by dielectrophoretic forces. A set of experiments performed under different experimental conditions show the proposed description of the phenomenon, while any possible ionization mechanism plays a minor role, even in ionic solutions. Theoretical argumentation which are based on classical electrophoretic theory support polarization scenario either of liquid or granular jets [3].

Taking into account principal differences between physical origin and properties of fluid and granular streams such an isomorphic kinetic behavior which is mentioned can also bring us to better understanding of some physical characters (like for instance surface tension) of considered systems.

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1. *Gerasyimov O.I., Aliotta F., Vasi C., Chernilevska I.A. Liquid and granular streams, manipulated by external inhomogeneous electric field. 8th International Conference PLMMP-2018.-P.103.*
 2. *Aliotta F., Calandra P., Pochylski M., Ponterio R. C., Salvato G., Vasi C. Is electrospray emission really due to columbic forces? AIP Advances 4.-2014.-P.097105*
 3. *Aliotta F., Gerasyimov O.I., Calandra P. Electrospray Jet Emission: An Alternative Interpretation Invoking Dielectrophoretic Forces // Intelligent Nanomaterials.-2016.-P.51-90.*



ABSTRACT BOOK

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