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Localising Gauss’s Law and the Electric Charge Induction on a Conducting Sphere

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Abstract : Space debris has numerous manifestations, including ferro-metalize and non-ferrous. The electric field will induce negative charges to split from positive charges inside the space debris. In this research, we focus only on conducting materials. The assumption is that the electric charge density of a conducting surface is proportional to the electric field on that surface due to Gauss's Law. We are trying to find the induced charge density from an external electric field perpendicular to a conducting spherical surface. An object is a sphere on which the external electric field is not uniform. The electric field is, therefore, considered locally. The localised spherical surface is a tangent plane, so the Gaussian surface is a very small cylinder, and every point on a spherical surface has its own cylinder. The electric field from a circular electrode has been calculated in near-field and far-field approximation and shown Explanation Touchless maneuvering space debris orbit properties. The electric charge density calculation from a near-field and far-field approximation is done.

Keywords : near-field approximation, far-field approximation, localized Gauss’s law, electric charge density
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