

**Fabre, Sylvie****Poisson's equation coupled with Boltzmann's relation in  $\mathbb{R}^N$  and quasineutrality. (Étude de l'équation de Poisson couplée à la relation de Boltzmann dans  $\mathbb{R}^N$  et quasineutralité.)**(French) [Zbl 0831.76099](#)

C. R. Acad. Sci., Paris, Sér. I 320, No. 1, 45-48 (1995).

Summary: We study the existence and uniqueness of solution in  $\mathbb{R}^N$  to Poisson's equation coupled with Boltzmann's relation, which gives a particular expression for the electron density. An asymptotic analysis yields a proof of the quasineutrality hypothesis for this model, where the Debye length can be neglected in comparison with the size of the system.

**MSC:**[76X05](#) Ionized gas flow in electromagnetic fields; plasmic flow[35Q35](#) PDEs in connection with fluid mechanics[35Q60](#) PDEs in connection with optics and electromagnetic theoryCited in **2** Documents**Keywords:**

existence; uniqueness; electron density; asymptotic analysis; Debye length