1051-82-40   **Ricardo Alonso**, Rice University, Department of Applied Mathematics, Houston, TX, **Emanuel Carneiro**, Institute for Advanced Study, School of Mathematics, Princeton, NJ , and **Irene M. Gamba*** (`gamba@math.utexas.edu`), The University of Texas at Austin, Department of Mathematics and ICES, Austin, TX 78712. *Convolution estimates for the Boltzmann Transport Equation and classical solutions and stability near Maxwellian data.*

We focus on the study of existence and uniqueness of distributional and classical solutions to the Cauchy Boltzmann problem case assuming S^{n-1}-integrability of the angular part of the collision kernel (Grad cut-off assumption) with data near Maxwellian distributions.

We will show convolution estimates of Young's inequality type for the case of hard potentials, Hardy-Littlewood-Sobolev type inequality for soft potentials [ACG]. The main technique is radial average symmetrization using classical tools of harmonic analysis. Then, using the Kaniel-Shinbrot iteration we present elementary proofs of existence for initial data near local Maxwellians [AG] to obtain globally bounded solutions for soft potentials. We also study the propagation of regularity using the convolution estimates estimate for the gain operator, and an L^p-stability result, with $1 < p < \infty$.

References

[ACG] R. Alonso, E Carneiro and I.M.Gamba, *Convolution inequalities for the Boltzmann collision operator*, submitted for publication (2009).

[AG] R. Alonso and I.M.Gamba, *Distributional and classical solutions to the Cauchy Boltzmann problem for soft potentials with integrable angular cross section*, submitted for publication (2009) (Received August 02, 2009)