

# Report from ESF-Short Visit Grant

Maciej Blaszk

21 November 2005

From 06.11.2005 to 16.11.2005 I paid a short visit to the Physics Department of the Complutense University in Madrid and personally to prof. M. Manas and his collaborators. The purpose of the visit was to establish a research collaboration in the field of integrable nonlinear partial differential equations. Both groups (from Poznan and Madrid) have been working intensely on the theory of integrable dispersionless (hydrodynamic type) field systems. The important subclasses of such systems are these known as the Whitham hierarchies, introduced for the first time by I. M. Krichever. Recently, in both groups some research has been done on this class of systems (nlin.SI/0510001, nlin.SI/0510068). During my visit in Madrid we initiated a research on the admissible quantized version of Whitham hierarchies, i.e. its dispersive integrable deformations. It seems that the majority of hierarchies from the class considered should have the dispersive counterpart. The work is in progress.

The second subject we have started to work on is related with the so called dispersionless Universal Hierarchy and its relation to finite dimensional Stackel systems. Our main target is to reconstruct a family of dispersionless systems constructed from an appropriate Killing tensors of related Stackel systems as admissible reductions of Universal Hierarchy in the frame of Lax formalism. That work will unify the recent results of both groups on that particular subclass of integrable dispersionless systems.