

# CORRESPONDENCES BETWEEN HIERARCHIES OF PSEUDO-SPHERICAL TYPE AND THE C. NEUMANN PROBLEM

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ABSTRACT. Hierarchies of evolution equations of pseudo-spherical type are introduced, generalizing the notion of a single equation describing pseudo-spherical surfaces due to S.S. Chern and Kettenblatt. This new structure provides a link between differential geometry and the study of hierarchies of equations which are the integrability condition of  $sl(2, \mathbf{R})$ -valued linear problems.

It is shown that there exists a local correspondence between *any two* (suitably generic) solutions of arbitrary hierarchies of equations of pseudo-spherical type. As an application, it is shown that one can transform a standard solution to a hierarchy of linear equations into an *arbitrary* stationary solution to the KdV hierarchy, via solutions to the C. Neumann equations of motion describing the evolution of finite number of particles on a sphere in the field of a quadratic potential.

## REFERENCES

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