

GEOMETRY SEMINAR

On a class of second order partial differential equations describing pseudo-spherical or spherical surfaces**Filipe Kelmer Alves**

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Time: 10:30 am

Abstract. We consider second order real partial differential equations of the form

$$\begin{cases} u_{xt} = F(u, u_x, v, v_x), \\ v_{xt} = G(u, u_x, v, v_x), \end{cases}$$

describing pseudo-spherical or spherical surfaces, meaning that, their generic solutions provide metrics, with coordinates (x, t) , on open subsets of the plane, with constant curvature $K = -1$ or $K = 1$. These systems can be described as integrability conditions of \mathfrak{g} -valued linear problems, with $\mathfrak{g} = \mathfrak{sl}(2, \mathbb{R})$ or $\mathfrak{g} = \mathfrak{su}(2)$, when $K = -1$, $K = 1$, respectively. We obtain characterization and also classification results. Applications of the theory provide new examples and new families which contains systems of equations such as Pohlmeyer-Lund-Regge and Konno-Oono.

References

- [1] Filipe Kelmer Alves, 2021, 'Uma classe de sistemas de equações diferenciais descrevendo superfícies pseudo-esféricas ou esféricas', Thesis presented to the University of Brasília, Brasília.