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Hyperheavenly spaces and their application in para-Kähler geometries

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The talk is devoted to the neutral 4-dimensional spaces. As a basic structure we consider weak, expanding hyperheavenly space, i.e., a space equipped with (at least one) integrable, totally null, 2-dimensional distribution which is not parallely propagated. It is assumed that this distribution is self-dual (SD). If a space is additionally equipped with two anti-self-dual (ASD), parallely propagated distributions, it becomes para-Kähler space. The metric of such a space is analyzed. Some new examples of para-Kähler and Einstein metrics are presented.

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