Hiroshima Mathematical Analysis Seminar No.221

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Unique continuation property with partial information for two- dimensional anisotropic elasticity systems

Unique continuation properties (UCP) for partial differential equations play an important role in both theoretical and applied aspects in such a sense that solutions on small domains can uniquely determine those on larger domains. In this talk, we consider the general two-dimensional anisotropic elasticity system whose solution is strongly coupled with two components. There are existing UCP results for elasticity systems when both components vanish, but in some industrial applications it is only possible to perform measurement for one component. Therefore, we investigate the UCP under the condition that only one of the two components in the solution vanishes in a subdomain. By appropriate changes of variables and utilizing Riemann function, we prove that the solution vanishes on the whole domain with at most five pieces of additional information on the other component at a single point. Moreover, we illustrate by examples that the additional information can be further weakened in special cases.

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