Claudia Capone Quasiharmonic fields and Beltrami operators

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Abstract: A quasiharmonic field is a pair $\mathcal{F} = [B, E]$ of vector fields satisfying divB = 0, curlE = 0, and coupled by a distorsion inequality. For a given \mathcal{F} , we construct a matrix field $\mathcal{A} = \mathcal{A}[B, E]$ such that $\mathcal{A}E = B$. This remark in particular shows that the theory of quasiharmonic fields is equivalent (at least locally) to that of elliptic PDEs.

Here we stress some properties of our operator $\mathcal{A}[B, E]$ and find their applications to the study of regularity of solutions to elliptic PDEs, and to some questions of G-convergence.

Keywords: quasiharmonic fields, Beltrami operator, elliptic partial differential equations, G-convergence **AMS Subject Classification:** 47B99, 35J20, 35D10, 35B40