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Jacobians with prescribed eignvectors.

We consider the problem of constructing all possible maps from an open subset $\Omega \subset \mathbb{R}^n$ to $\mathbb{R}^n$, such that the set of eigenvector fields of the Jacobian matrix of each of these maps contains a given set of $m \leq n$ independent vector fields on Ω. Our initial motivation for considering this problem comes from the geometric study of hyperbolic conservation laws. This problem is, however, of independent geometric interest and, in turn, leads to an interesting systems of overdetermined systems of PDEs, which can be studied via classical integrability theorems and their appropriate generalizations. (Received September 05, 2016)