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A projection scheme for velocity field reconstruction in the left ventricle SARAH FRANK, University of California, Berkeley, JUAN CARLOS DEL ALAMO, University of California, San Diego, SHAWN C SHADDEN, University of California, Berkeley — Color Doppler ultrasound is a convenient and relatively inexpensive tool that can be used to measure the radial flow field inside the heart. Recently, this technology has been extended to produce a two-component flow field on the apical long axis plane of the left ventricle [1]. Specifically, the azimuthal component is reconstructed by solving a planar continuity equation based on the assumption that through-plane divergence is negligible. In this work we present an alternative scheme that solves for the eigenmodes of the left ventricle, projects available data onto these modes, and solves for the optimal projection using least-squares methods. Alternative implementations of this approach are considered and compared. To make comparisons, we applied this method to the radial component only of three-directional MRI velocity data in the long-axis plane. Subsequently, the reconstructed velocity fields were compared to the original full MRI velocity field. [1] Garcia D, Del Alamo JC, Tanne D, Yotti R, Cortina C, Bertrand E, Antoranz JC, Perez-David E, Rieu R, Fernandez-Aviles F, Bermejo J (2010) Two-dimensional intraventricular flow mapping by digital processing conventional color-Doppler echocardiography images. IEEE Trans Med Imaging 29 (10):1701-1713.

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