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**Gary R Jensen\*** ([gary@math.wustl.edu](mailto:gary@math.wustl.edu)), Math Dept, Campus Box 1146, Washington University, One Brookings Drive, St. Louis, MO 63130, and **Emilio Musso** and **Lorenzo Nicolodi**. *Surface immersions with unique Bonnet mate*. Preliminary report.

A Bonnet mate of an immersion  $\mathbf{x} : M^2 \rightarrow \mathbf{R}^3$  is a non-congruent immersion  $\tilde{\mathbf{x}} : M \rightarrow \mathbf{R}^3$  with the same induced metric,  $d\tilde{\mathbf{x}} \cdot d\tilde{\mathbf{x}} = d\mathbf{x} \cdot d\mathbf{x}$ , and the same mean curvature function  $\tilde{H} = H$ . If  $\mathbf{x}$  possesses a Bonnet mate, it is called a Bonnet immersion. If it possesses more than one distinct mate, it is called a proper Bonnet immersion. Bonnet (1867) proved that umbilic free proper Bonnet immersions are isothermic. Graustein (1924) proved that if  $\mathbf{x}$  is isothermic and Bonnet, then it is proper Bonnet. In this talk we prove that if  $\mathbf{x}$  is totally non-isothermic (to be made precise) then it has a unique Bonnet mate. (Received August 12, 2016)