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3-manifolds covered by three open balls or solid tori

Hempel and McMillan showed that a closed 3-manifold M that can be covered by three open balls is a connected sum of S^3 and S^2-bundles over S^1. We sketch a new proof of a slightly generalized result and show how the proof can be adapted to classify closed 3-manifolds covered by one open solid torus and two open balls or by two open solid tori and one open ball. We think that with these methods we will be able to handle the case for 3 open solid tori.