To verify our implementation, we manufacture a solution that satisfies the continuity equation. Using the identity

$$\boldsymbol{\nabla} \cdot (\boldsymbol{\nabla} \times g(\mathbf{x})) = 0, \tag{16}$$

for any function $g(\mathbf{x})$, we can easily manufacture a solution by choosing some vector function $g(\mathbf{x})$, projecting it onto the sphere via $P_x g(x)$ and applying the curl projection, Q_x:

$$Q_x = \begin{bmatrix} 0 & -x_3 & x_2 \\ x_3 & 0 & -x_1 \\ -x_2 & x_1 & 0 \end{bmatrix}. \tag{17}$$