The Maxwell equations of electrodynamics in vacuum with GLM divergence cleaning [2, 1] read as follows:

$$\frac{\partial \mathbf{B}}{\partial t} + c\,\nabla \times \mathbf{E} + \nabla \phi = 0, \tag{1}$$

$$\frac{\partial \mathbf{E}}{\partial t} - c\,\nabla \times \mathbf{B} + \nabla \psi = 0, \tag{2}$$

$$\frac{\partial \phi}{\partial t} + a_h^2\,\nabla \cdot \mathbf{B} = 0, \tag{3}$$

$$\frac{\partial \psi}{\partial t} + a_h^2\,\nabla \cdot \mathbf{E} = 0, \tag{4}$$

where $c = 1$ denotes the light speed and $a_h = 1$ is an *artificial cleaning speed* to avoid the local accumulation of discrete divergence errors.

References

[1] A. Dedner, F. Kemm, D. Kröner, C. D. Munz, T. Schnitzer, and M. Wesenberg. Hyperbolic divergence cleaning for the MHD equations. *Journal of Computational Physics*, 175:645–673, 2002.

[2] C.D. Munz, P. Omnes, R. Schneider, E. Sonnendrücker, and U. Voss. Divergence Correction Techniques for Maxwell Solvers Based on a Hyperbolic Model. *Journal of Computational Physics*, 161:484–511, 2000.