Model for Open Loop calculation of Vref

Given the most general electrical model of a magnet with parameters:

|  |  |
| --- | --- |
|  | Cable Resistance |
|  | Magnet Winding Resistance |
|  | Parallel Resistance |
|  | Magnet (Differential) Inductance |

The following differential equation must hold true:

There are different implementation methods in order to solve for .

One way is to substitute and then choose one of the following discretization methods and eventually write in terms of past values and and current value .

|  |  |
| --- | --- |
| Forward Euler |  |
| Backward Euler |  |
| Tustin |  |