Numerical Simulation of Gas-Liquid Two-Phase Flow in a Gas Diffusion Layer of PEFC Using the Lattice Boltzmann Method
Yuji HONJO  Kengo SUZUKI  Yutaka TABE  Takemi CHIKAHISA

• Background
  Flooding phenomenon
  Liquid water
  Good power generate
  Bad power generate

• Purpose
  To propose high drainage performance GDL
  Gas
  Water
  Gas
  MEA
  GDL
  MEA
  GDL

• Lattice Boltzmann Method (LBM)
  In LBM, fluid is regarded as aggregate of many particles to repeat translation and collision.
  LBM is suitable for parallel computation. So it makes computation time short
  Macro scale
  Fluid
  Modeling
  Micro scale
  Fluid particles
  Navier-Stokes Equations
  Boltzmann Equations

• Result
  We will propose high drainage performance GDL by changing wettability, structure and so on.
  Hydrophobic GDL
  Hydrophilic GDL