

# A short guide to understand the solver

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1. A simple PBM implementation using Number Density Approach. This method is really similar to IATE model in OpenFoam. The idea originates from the following paper:

## NDPBM

Class Foam::diameterModels::NDPBM

Description NDPBM (Number Density Approach Population Balance Model) bubble diameter model

"CFD modeling of gas dispersion and bubble size in a double turbine stirred tank"  
F. Kerdouss,  
A. Bannari,  
P. Proulx,  
Chemical Engineering Science, Vol.61 December 2006

2. The overall solver including various PBM models (Class Methods, QMOM and EQMOM (OpenQBMM) with few implemented breakage and coalescence kernels:

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..	OpenQBMM	
IATE	Coupling between OpenQBMM and twoPhaseEulerFoam is done here.	PhD project ! 5 months ago
PBM		PhD project ! 5 months ago
constantDiameter		PhD project ! 5 months ago
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#### CM and QMOM:

These models previously were implemented in OF 1.7 and OF 2.3 in my PhD research group.

I converted all the codes to the most recent version of OF and fully coupled that in each sub model in which bubble or droplet size distribution is needed.

### 3. New solvers and modified libraries in OpenQBMM:

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twoPhaseEulerPBMKla3PostFoam	5 months ago
twoPhaseEulerPBMKla4Foam	5 months ago
twoPhaseEulerPBMKlaFoam	5 months ago
twoPhaseEulerPBMKlaPostFoam	5 months ago

To understand the titles better:

- 1- Two, there or four quadrature nodes
- 2- Implementation and coupling for mass transfer coefficient (KLa)
- 3- Post stands for a solver which is used for post processing (see controlDict)

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populationBalanceModel.H	Welcome to git my PhD project ! 5 months ago
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Added libraries to OpenQBMM including new breakage and coalescence events

#### 4. The implementation of different mass transfer coefficients in reactingEulerFoam original solver:

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5. The solvers were applied to Rushton and BioReactor mixers which can be found here:

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