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Title:	LANL’s 2PP Requirement for Mix & Burn Study
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LANL's 2PP Requirement for Mix & Burn Study

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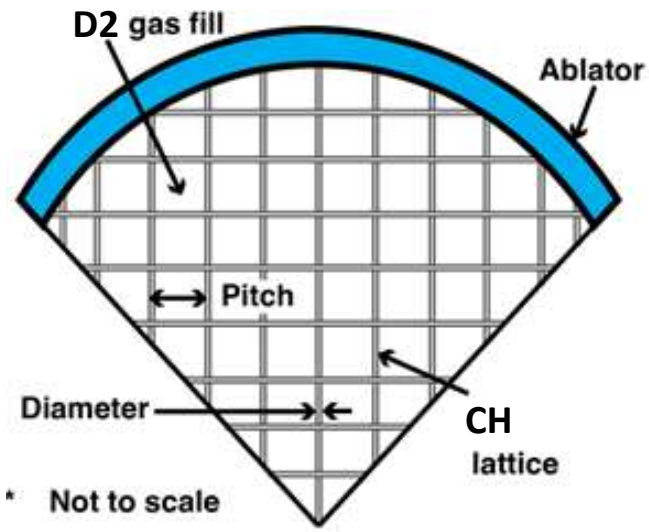
Idea 1: 2PP printed spherical capsule

Pie Diagram of Spherical Capsule

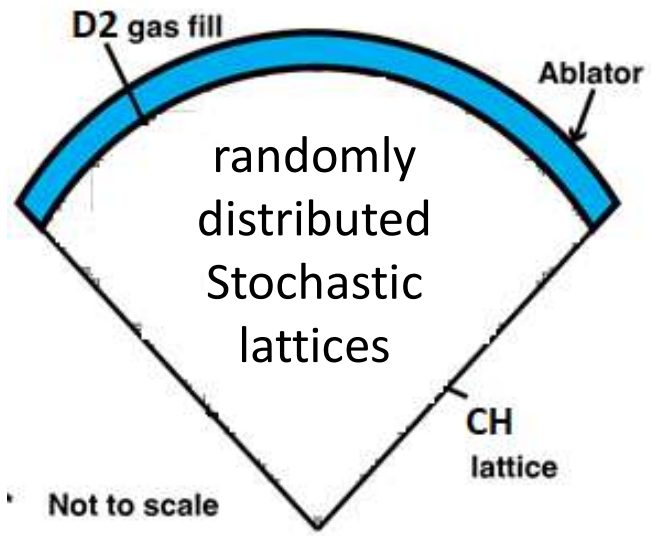


Capsule diameter (OD) = 860 um

- Goal is to investigate how much CH lattices will mix with D2 gas and how well can we simulate?
- Cubic shape with a fixed pitch size = 50 um x 50 um x 50 um
- Can an ablator be printed by 2PP ?
- Can ablator hold a gas pressure (3 atm)?
- Capsule types:
  - A = lattice diameter of 1 um
  - B = lattice diameter of 2 um
  - C = lattice diameter of 3 um

Idea 2: stochastic lattices

Pie Diagram of Spherical Capsule

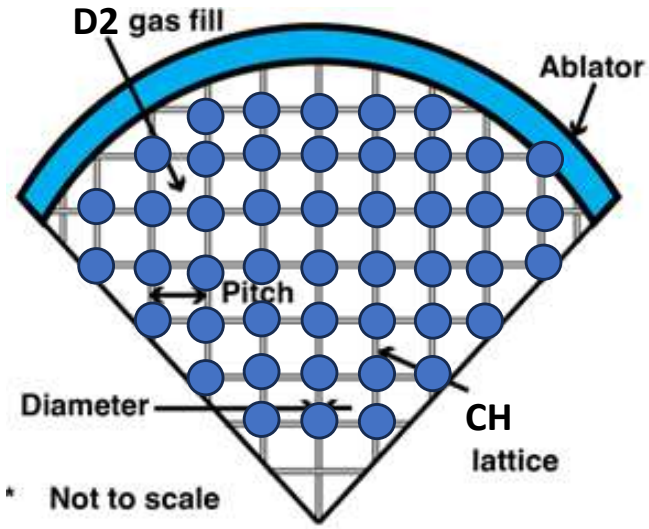


Capsule diameter (OD) = 860 um

- Can 2PP capsule be printed with stochastic lattices?
- Can average density be varied?

Idea 3: de-mixing capsule

Pie Diagram of Spherical Capsule

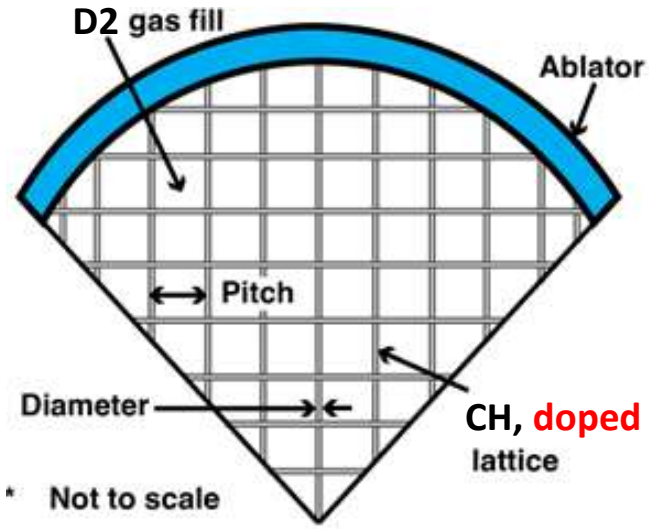


Capsule diameter (OD) = 860 um

- Goal is to investigate the de-mixing effect by using dots connected with lattices
- Cubic shape with a fixed pitch size = 50 um x 50 um x 50 um & a fixed lattice diameter = 1 um
- Can lattices be connected with dots ?
  Diameter of dots will be determined by further design study

Idea 4: lattices with a tracer dopant

Pie Diagram of Spherical Capsule

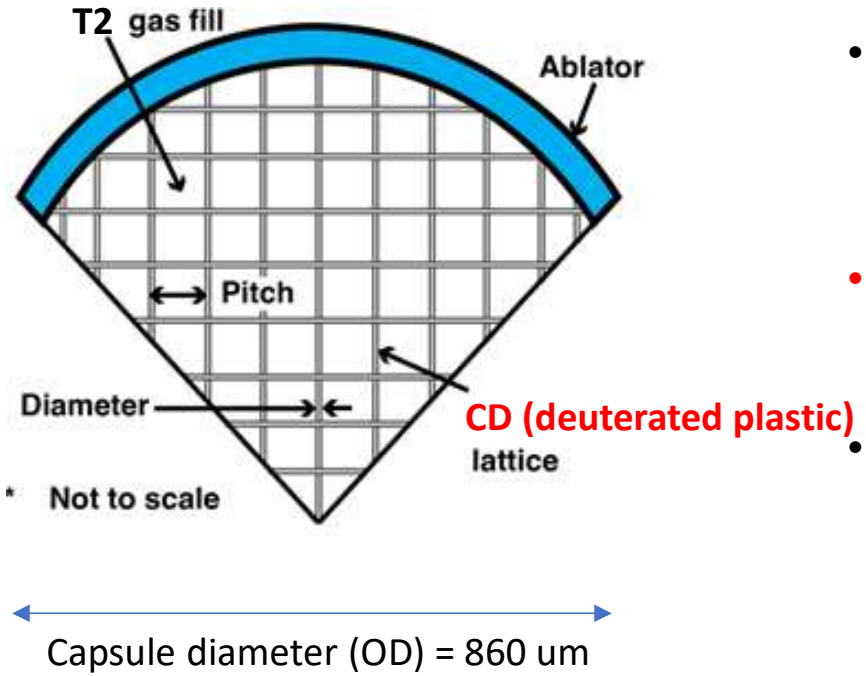


Capsule diameter (OD) = 860 um

- Goal is to investigate the degree of thermal equilibrium between lattice and gas
- Cubic shape with a fixed pitch size = 50 um x 50 um x 50 um & a fixed lattice diameter = 1 um
- Can a CH lattice be doped with few % Ti or few % Cl?

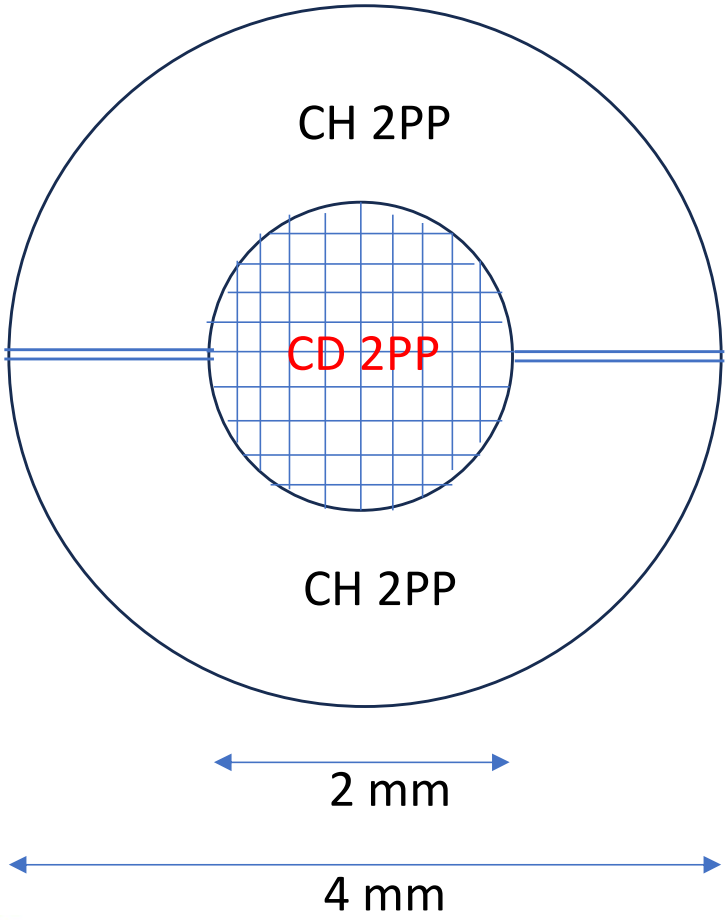
Idea 5: Deuterated 2PP sphere

Pie Diagram of Spherical Capsule



- Goal is to investigate the degree of thermal equilibrium between lattice and gas
- Cubic shape with a fixed pitch size = 50 um x 50 um x 50 um & a fixed lattice diameter = 1 um
- Can a lattice be made of deuterated plastic (CD)?
- Capsule types:
  - A = lattice diameter of 1 um
  - B = lattice diameter of 2 um
  - C = lattice diameter of 3 um

Hybrid capsule can be beneficial for future campaign



- CD-2PP full sphere
  - Diameter = 2 mm
  - Cell size = 50 um x 50 um x 50 um
  - Density = 15 mg/cc requested to GA (but 55 mg/cc for simulation study)
  - Deuteration fraction = 90% requested to GA (75% for simulation study)
- CH-2PP hemi-sphere
  - Out Diameter = 4 mm
  - Inner Diameter = 2 mm
  - Cell size = 50 um x 50 um x 50 um
  - Density = 10 mg/cc