First draft of the HERD improved reference design

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Disclaimers

- Simplified design
  - Almost only active elements
- Based only on science performance consideration
  - No feasibility constrain
- Under scientific revision
- Intended as a first input from scientists to engineers
Old reference

- **Distances:**
  - Top
    - CALO-FIT: 15 cm
    - FIT-PSD: 20.28 cm
    - PSD-SCD: 2 cm
  - Sides
    - CALO-FIT: 8.63 cm (X), 11.53 cm (Y)
    - FIT-PSD: 9.95 cm
    - PSD-SCD: 2 cm

- **FIT**
  - Top
    - 5 double layers
    - 116.6 x 116.6 (X x Y) cm²
  - Sides
    - 9 double layers
    - 106 x 74.2 (H x V) cm²

- **PSD**
  - Tiles, one layer
  - 10 x 10 cm² tiles
  - Top
    - 20 x 20 (X x Y) tiles
  - Sides
    - 16 x 11 (H x V) tiles

- **SCD**
  - Top
    - 20 x 20 (X x Y) wafers
  - Sides
    - 18 x 9 (H x V) wafers
Improved reference

- **Distances:**
  - Top
    - CALO-FIT: 5 cm
    - FIT-PSD: 2 cm
    - PSD-SCD: 2 cm
  - Sides
    - CALO-FIT: 4.1 cm (X), 5 cm (Y)
    - FIT-PSD: 5 cm
    - PSD-SCD: 4 cm
    - SCD-TRD: 5 cm

- **FIT**
  - Top
    - 7 double layers
    - 116.6 x 116.6 (X x Y) cm²
  - Sides
    - 7 double layers
    - 106 x 74.2 (H x V) cm²

- **PSD**
  - Tiles, two staggered layers
  - 10 x 10 cm² tiles
  - Top
    - 14 x 14 (X x Y) tiles
  - Sides
    - 13 x 9 (H x V) tiles

- **SCD**
  - Top
    - 17 x 17 (X x Y) wafers
  - Sides
    - 16 x 10 (H x V) wafers

- **TRD**
  - 3x3 modules
Perspective

- The design is being discussed before being freeze for physics performance studies
  - Early inputs from engineers are welcome at this stage
- After freeze a “well-defined” set of basic parameters will be available as a reference for engineering design
  - # and size of elements, relative distances etc.
- Design modifications from engineering work will be transferred back to science simulation
  - Preliminary efforts already started