**Selective Aluminum Etch Process (SAEP)**

Starting material: Si wafer, DSP, with thermal oxide (100 nm) and LPCVD nitride (500 nm).

1. Nb Plug Deposition. Pattern lift-off mask for Nb plugs, deposit Nb, 200 nm, and lift off.

2. Trilayer Deposition. Deposit Al trilayer, Al(265)/Al-Ox/Al(60) (thickness in nm).

3. Base Layer Patterning. Pattern base electrode layer, wiring and pads with resist mask, and ion mill through top Al layer; strip resist.

4. Counter-Electrode Patterning. Pattern top counter-electrode layer with resist mask, ion mill down to base layer and to clear field areas, anodize to 70V; strip resist.

5. Link Etch. Pattern resist mask with windows over anodized Al base wiring where Nb plugs will be formed, ion mill to remove anodized Al and underlying Al (depth TBD); strip resist.

6. Nb Wiring Deposition. Pattern lift-off mask for Nb wiring and pads, deposit Nb, 600 nm, and lift off.

7. Au Pad Deposition. Pattern lift-off mask for Au pads, deposit Au, 300 nm, and lift off.

8. Absorber Deposition. Pattern lift-off mask for Pb absorbers, deposit Pb, thickness TBD, lift off.

9. SU-8 Post Formation. Spin coat wafer with SU-8, thickness TBD, and pattern collimator posts.

10. Backside Etch. Bond wafer to backing wafer, face down, pattern backside resist mask, etch through wafer to release membranes; remove die from backing wafer and clean.

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| **CAD Layer** | **GDS** | **Sequence** | **Digitized Data** | **Resist Polarity** | **Description** |
| Plug | 1 | 1 | Dark | Neg | Nb plugs |
| Base | 3 | 2 | Dark | Pos | Base layer etch |
| Cntr | 4 | 3 | Dark | Pos | Counter-electrode etch and anodization |
| Etch | 9 | 4 | Clear | Pos | Link etch |
| Wire | 8 | 5 | Dark | Neg | Nb wiring and pads |
| Au | 14 | 6 | Dark | Neg | Au pads |
| Abs | 10 | 7 | Dark | Neg | Pb absorber |
| SU8 | 18 | 8 | Clear | Neg | SU8 posts |
| Col | 16 | - | Dark | Pos | Collimator |
| Key | 20 | - | Clear | Pos | Key etch for collimators |
| DE | 7 | 9 | Clear | Pos | Deep etch to release membranes |
| PVIA | 15 | - | Clear | Pos | Pad etch (not used) |