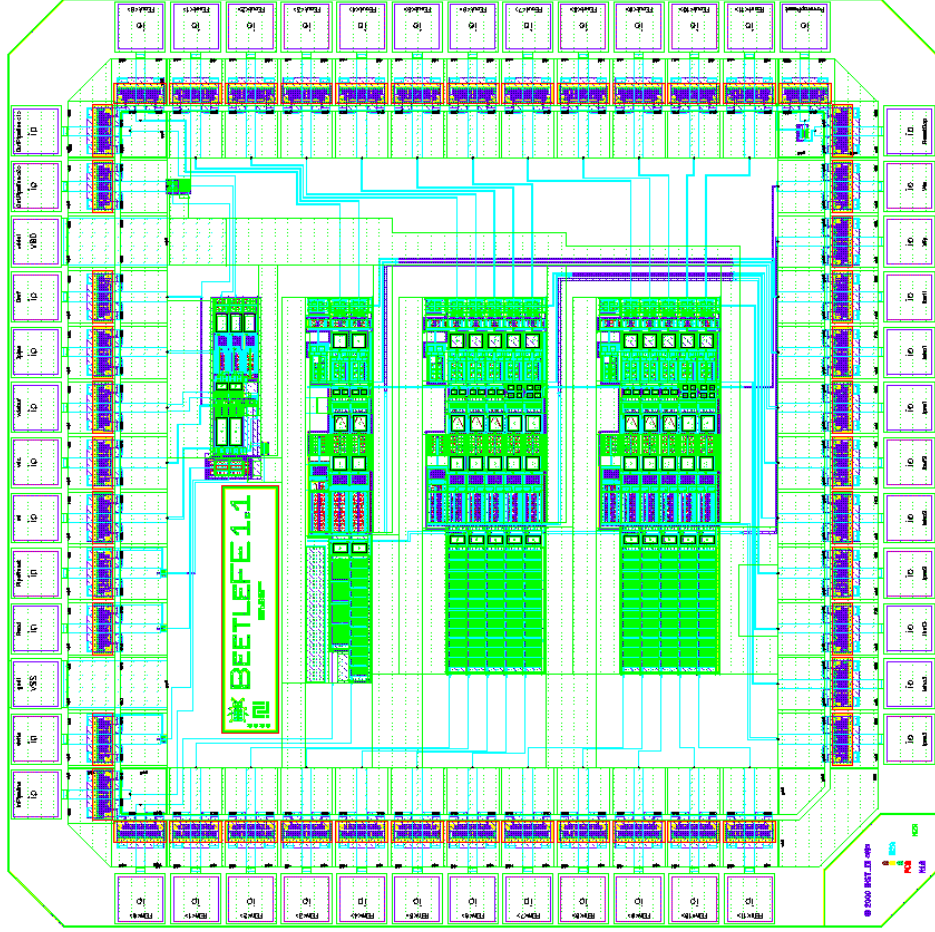# Beetle

Ein strahlenharter Auslesechip für LHCb

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BeetleFE 1.1

(teststructure pipeamp Beetle 1.1)

Set 1 (A..B)
nmos

A = BeetleFE 1.0 Set 4
B = Beetle 1.0 / 1.1

Set 2 (A..E)
nmos

new bias   A = Beetle 1.0 / 1.1
B..C = mod. Preamp
D..E = mod. Shaper

Set 3 (A..E)
nmos

new bias   A = Beetle 1.0 / 1.1
B..C = mod. Preamp
D..E = mod. Shaper

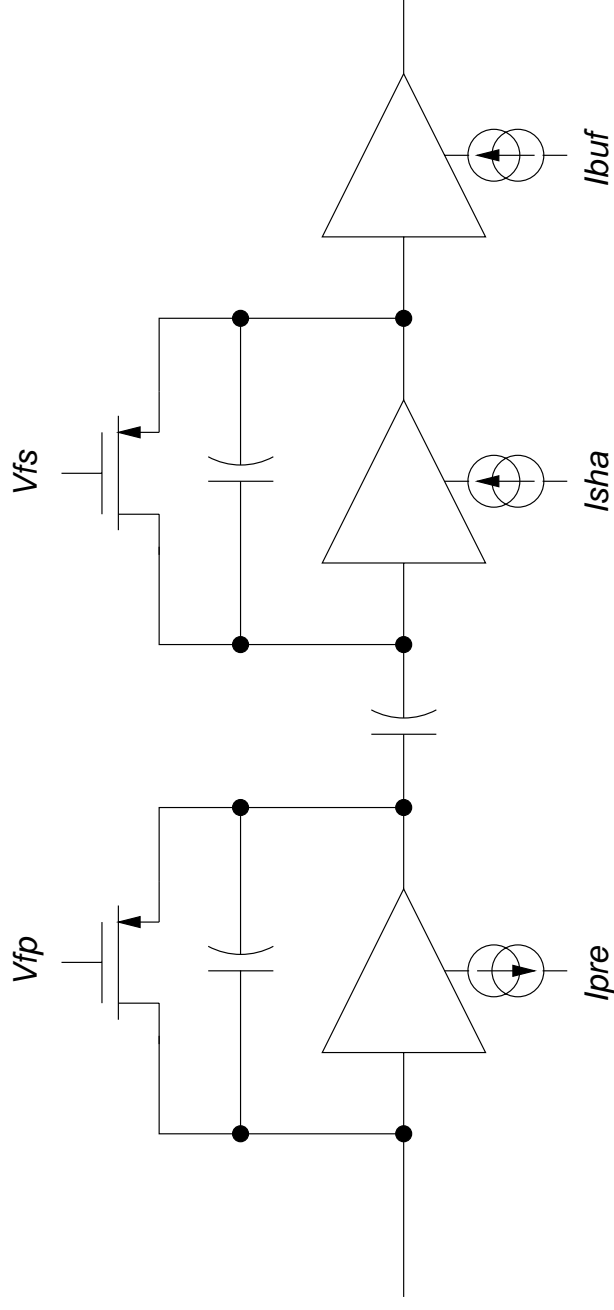*(reset teststructure)*

BeetleFE 1.1 / 1.2
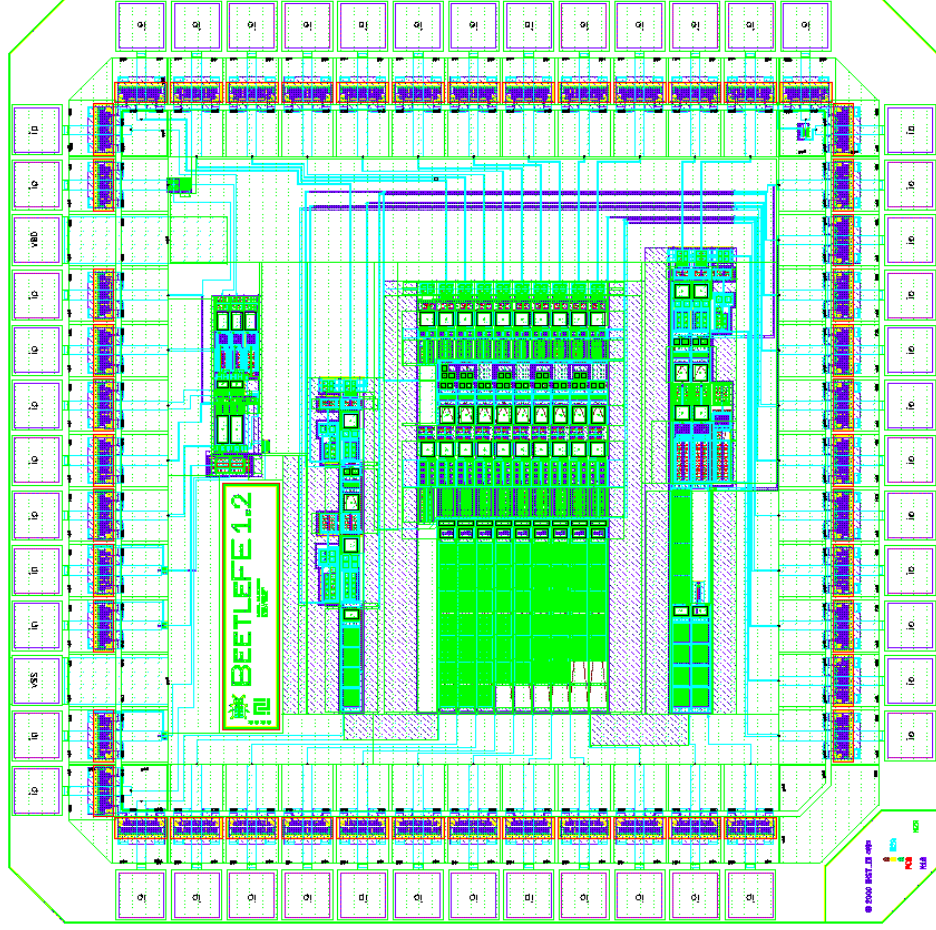
BeetleFE 1.2

Set 2 (1)
pmos

1 = BeetleFE 1.0 Set 2

Set 5 (1..9)
pmos

1..3 = Preamp (Waffle), diff. Shaper
4.5 = Premap (Waffle), diff. Shaper
6.7 = Preamp (enclosed), diff. Shaper
8.9 = Preamp (Waffle), diff. Shaper

Set 6 (1..2)
nmos

1 = Beetle 1.0 / 1.1 with nmos feedback
2 = Beetle 1.0 / 1.1

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Vfp

Vfs

Ipre

Isha

Ibuf

preamplifier

shaper

buffer