The Undulator Positron Source and GigaZ Option

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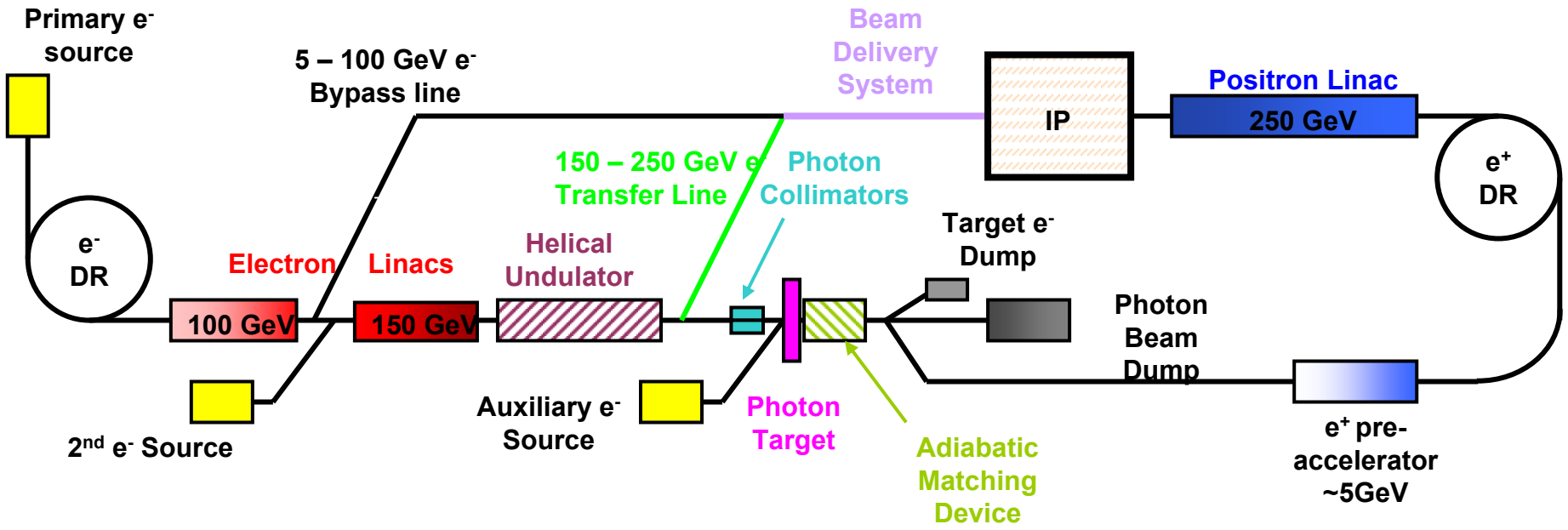
Requirements

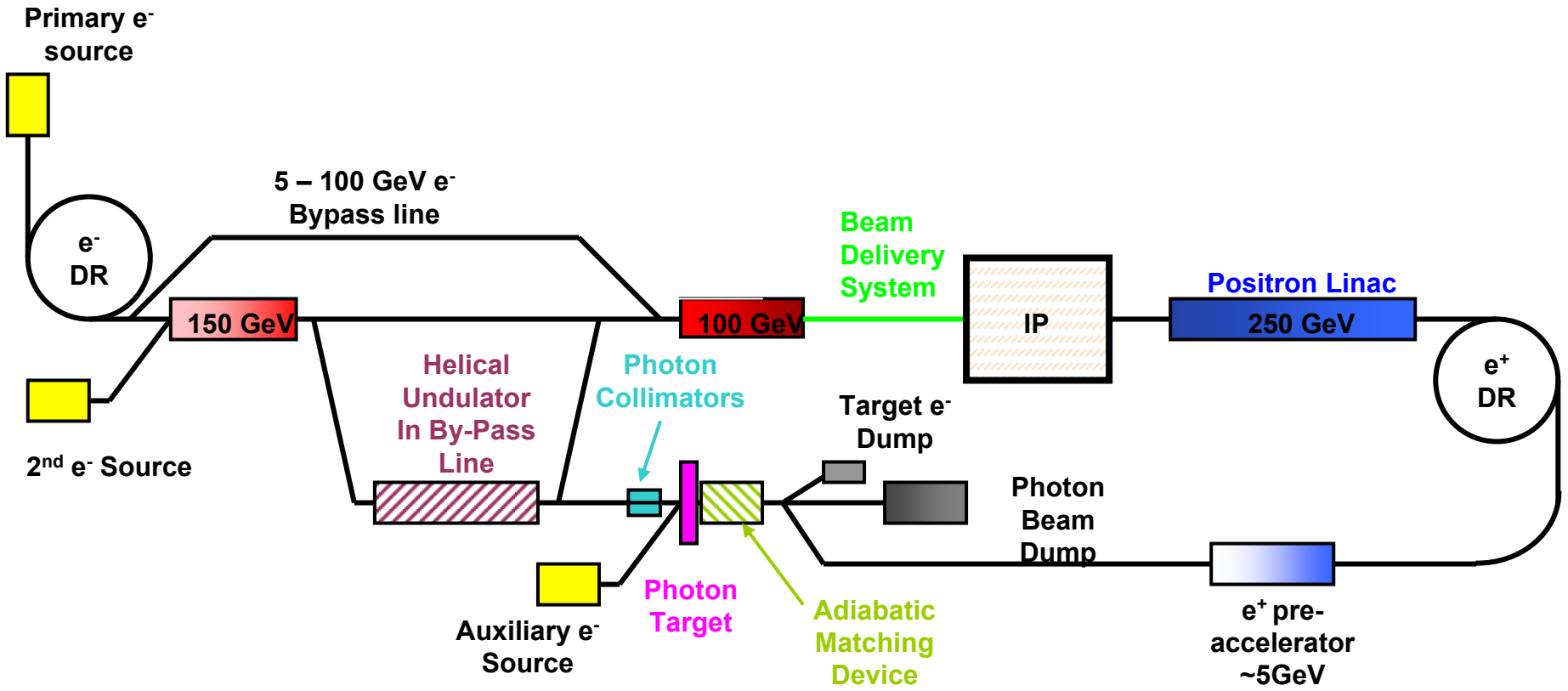
- Need ~50GeV electron beam at IP
- Need 150GeV (minimum) electron beam for the undulator to work
- Two options
  - Split the electron linac in two
  - Decelerate the electrons
- Going to show a few schematics of layouts
- (They are from the positron source sessions, so biased towards positron source components!)

Schematic Layout – Undulator @ 250GeV & Transfer Paths

NB bypass line can go anywhere between 50GeV and 100GeV

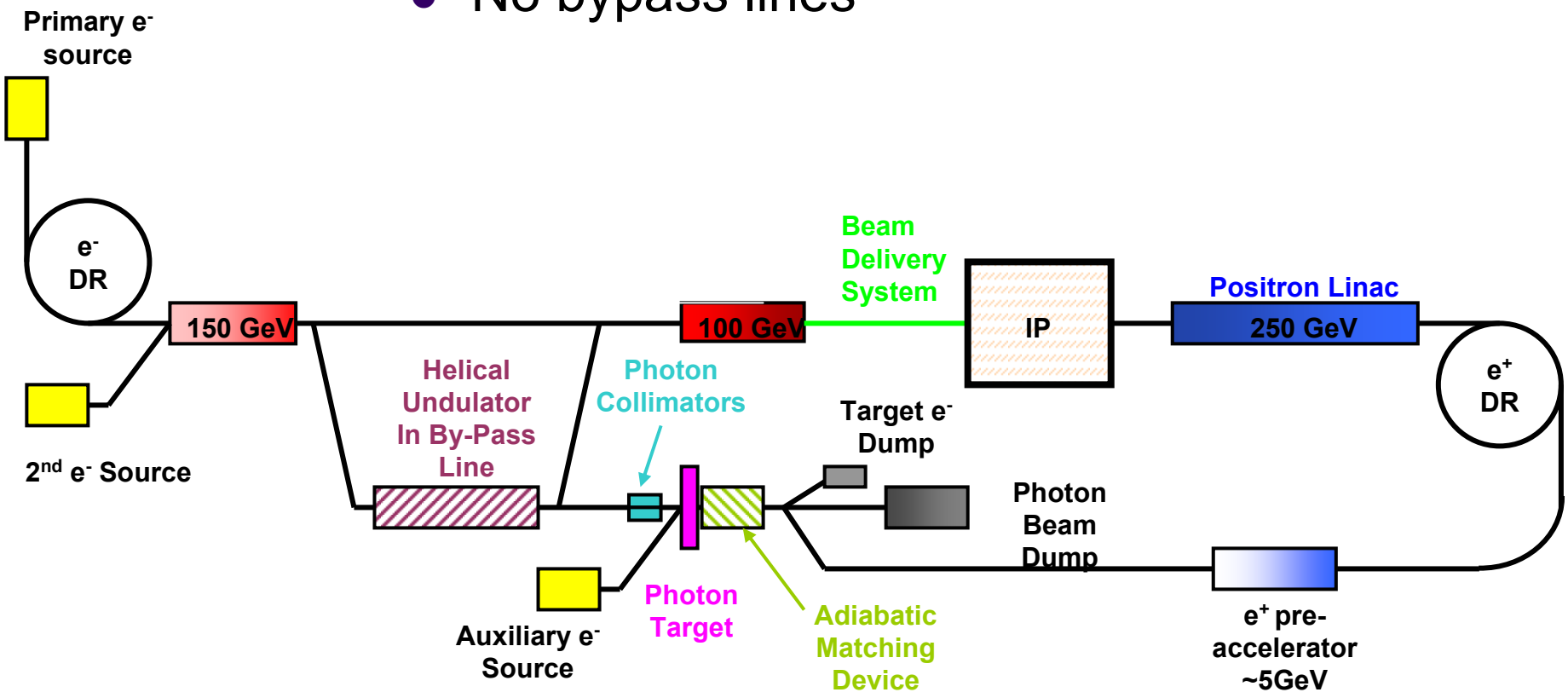


Schematic Layout – Undulator @ 150GeV & Transfer Paths



Schematic Layout – Undulator @ 150GeV & Deceleration

- No bypass lines



Requirements

- All schemes will work – but make operation/design more complicated
- Deceleration seems more complicated
  - Bunch to bunch energy jitter is proportional to the number of klystrons so gets better
  - Relative energy spread in a bunch is proportional to the linac length so increases
  - Fixes undulator at 150GeV
  - Operation more complicated
- Transfer paths seem like a better option
  - Cost a bit more money