

Q7. Positron Source Recommendation

Jim Clarke

on behalf of

John Sheppard, Masao Kuriki, Philippe Piot
and all the contributors to WG3a

After a very thorough examination of all the available information the following recommendations have been **agreed and endorsed by all** the convenors and attendees of WG3a

Baseline Recommendation

Helical Undulator
Based Positron
Source with Keep
Alive System

Alternative Study Recommendation

Laser Compton Based Positron Source

Additional Recommendation

Conventional Source is a backup to
the undulator based source

BUT

No further R & D should be carried out
on the conventional source at this time

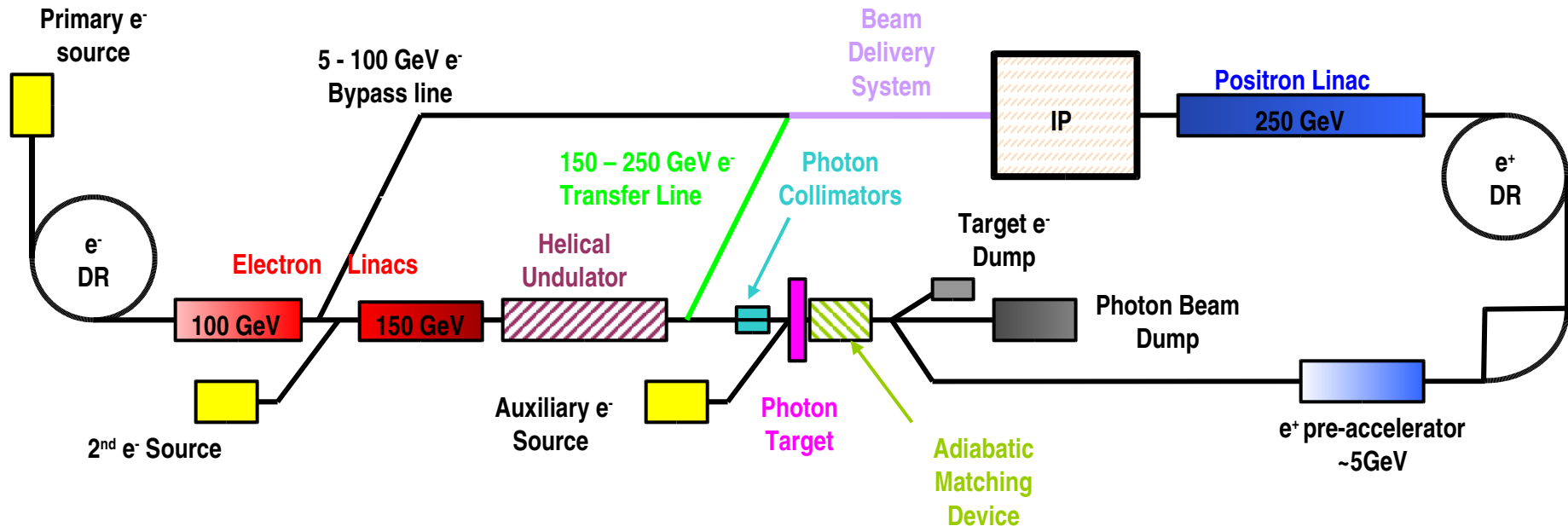
Claim for Baseline Recommendation

- **The undulator based source offers the greatest certainty of meeting the required positron source design specification**
- Full details of justification will be in our report which will be available to the community shortly (in draft stage at present)
- Presented here is a very brief synopsis

Justification

Issue	Undulator	Conventional
Target	Half fatigue limit	At fatigue & speed limit
Beam size on target	insensitive	Yield x0.5 if spot x2
Radiation Level	Medium	High
Positron capture efficiency	29 to 36 %	8 to12 %
Thermal load on Capture systems	8.5 kW/m	75 kW/m
DR Acceptance	Large Margin	Small Margin
Availability	78 % (with keep alive)	80 %
Polarisation	Simple Upgrade	Significant Installation

Undulator at end of electron main linac and with keep-alive source



- **Baseline Recommendation**
 - Helical Undulator Based Positron Source with Keep Alive System
- **Alternative Study Recommendation**
 - Laser Compton Based Positron Source
- **Additional Recommendation**
 - Conventional Source is a backup to the undulator based source but no further R & D should be carried out on the conventional source at this time
- R&D proposals for Baseline & Alternative are under development and will be part of documentation