

# **Consideration on Low energy operation of undulator based e+ source**

**ILC-CLIC e+ studies  
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# Low energy operation of undulator based e+ source

## Issues: Physics

- (1) Do we need scan at  $E_{cm} = 208 - 240$  GeV?
- (2) Do we need Z-pole ( $E_{cm} = 91$  GeV) running (Giga-Z)?
- (3) Do we need running at W-pair production ( $E_{cm} = 161$  GeV)?

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## Options: Accelerator

- (1) Do not employ 10Hz operation. Employ 230m undulator. (Andriy)  
We can make initial and operation cost reduction.

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- (2) Employ 10Hz operation. Employ 147m undulator. (RDR solution)  
We can make low energy running at  $E_{cm} = 91, 161, 208-240$  GeV.

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We can make operation cost reduction, but slightly higher initial cost.  
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Do we give up Giga-Z, W-pair, and 208 – 240 GeV? -> If No ->

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(a) Add 10Hz later.

-> Change all refrigerators and modulators (Klystron PSs).  
Very expensive additional investment, not realistic.

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Very expensive additional investment, not realistic.

(b) Apply 2.5+2.5 Hz operation.

-> We can go to any low energy with 1/2 luminosity.

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