

## High Luminosity

Beam Mom [GeV/c]	cms Energy [GeV/c <sup>2</sup> ]	Cross Section [mb]*	Average Luminosity [cm <sup>-2</sup> s <sup>-1</sup> ]**	Interaction Rate [MHz]
1,50	2,25	100,26	5,0E+31	5,01
4,06	3,09	65,80		
8,90	4,31	57,51		
11,91	4,92	51,70		
15,00	5,47	51,00	1,6E+32	8,16

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1,50	2,25	100,26	7,0E+30	0,70
4,06	3,09	65,80		
8,90	4,31	57,51		
11,91	4,92	51,70		
15,00	5,47	51,00	1,1E+31	0,56

\* <http://lxpndwww.gsi.de/pbarx/showdata.php?chan=1000>

\*\* Panda Physics Performance Report page 29 Figure 2.15

\*\*\* <https://indico.gsi.de/getFile.py/access?contribId=24&sessionId=7&resId=0&materialId=slides&confId=2366>

# Panda Physics Performance Report page 29 Figure 2.15

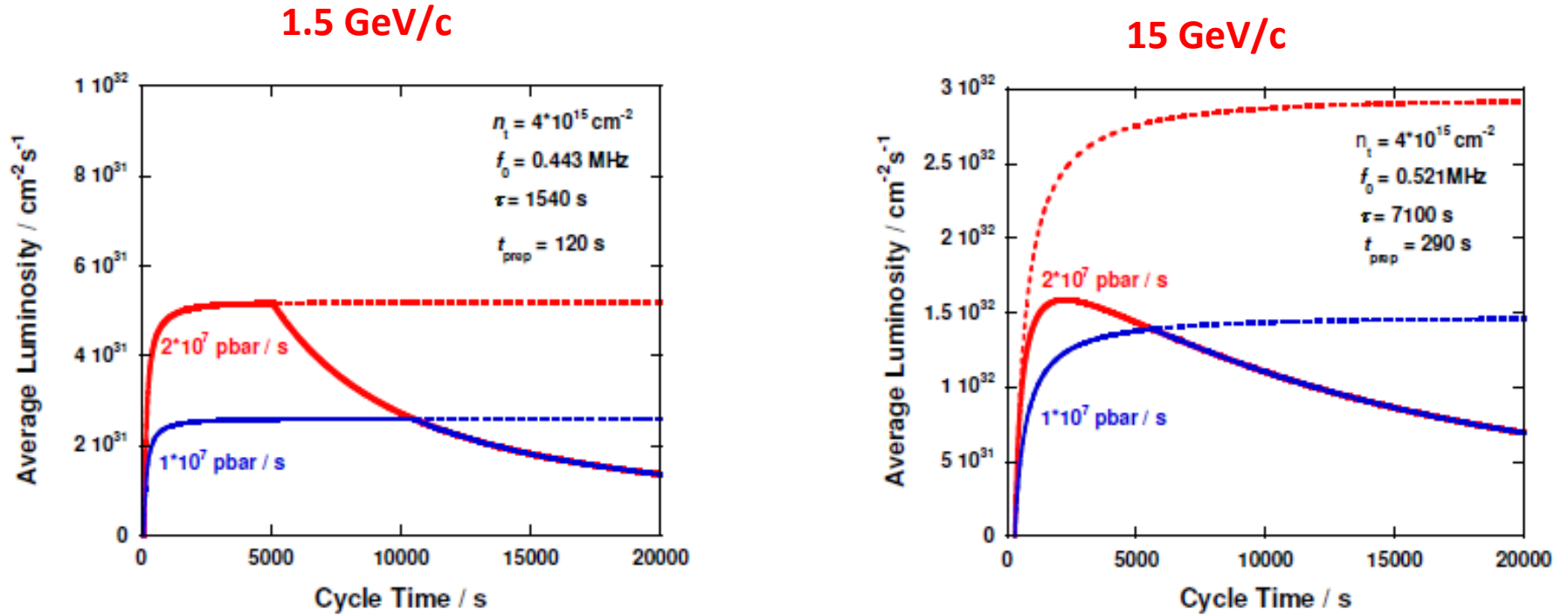


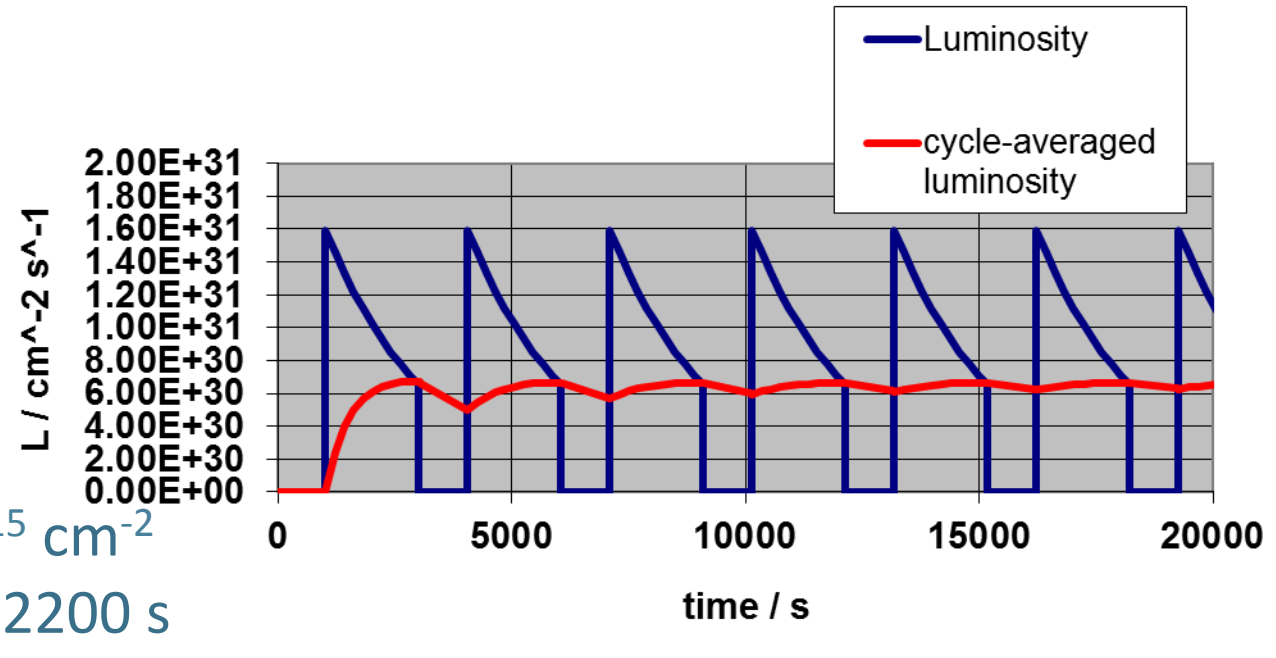
Figure 2.15: The maximum number of particles is limited to  $10^{11}$  (solid line), and unlimited (dashed lines).

# Low luminosity

$p = 1.5 \text{ GeV}/c$

target thickness =  $4 \cdot 10^{15} \text{ cm}^{-2}$

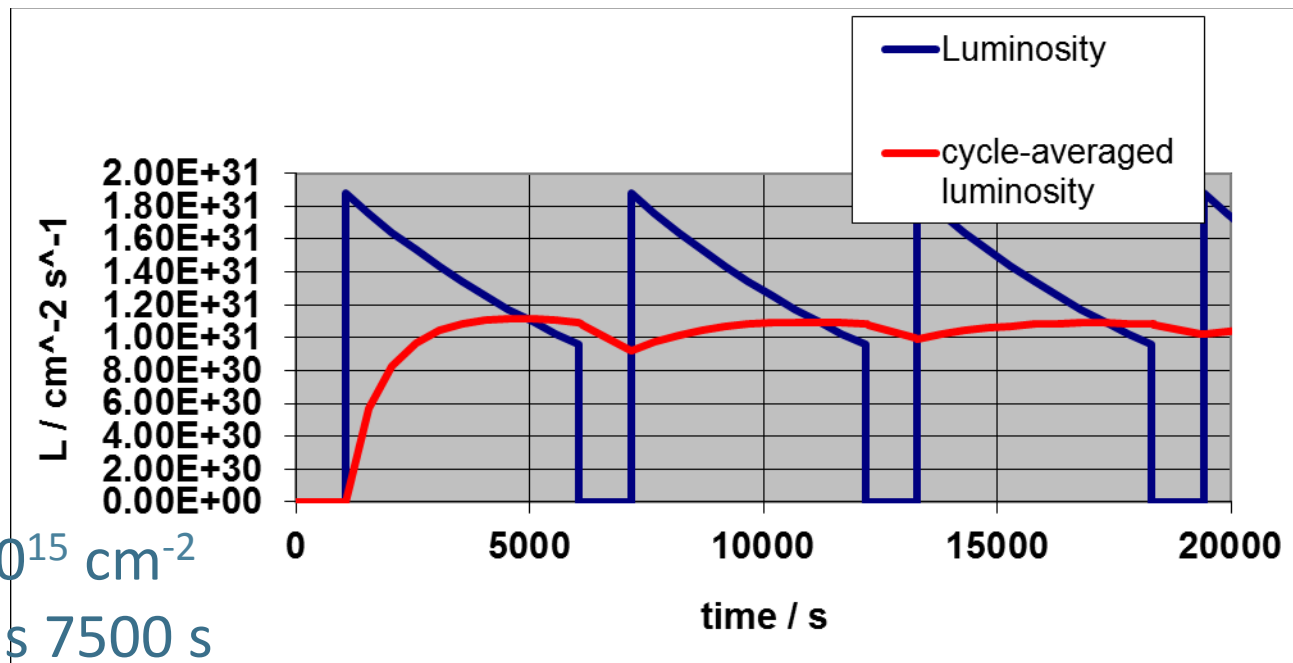
→ 1/e-beam lifetime is 2200 s



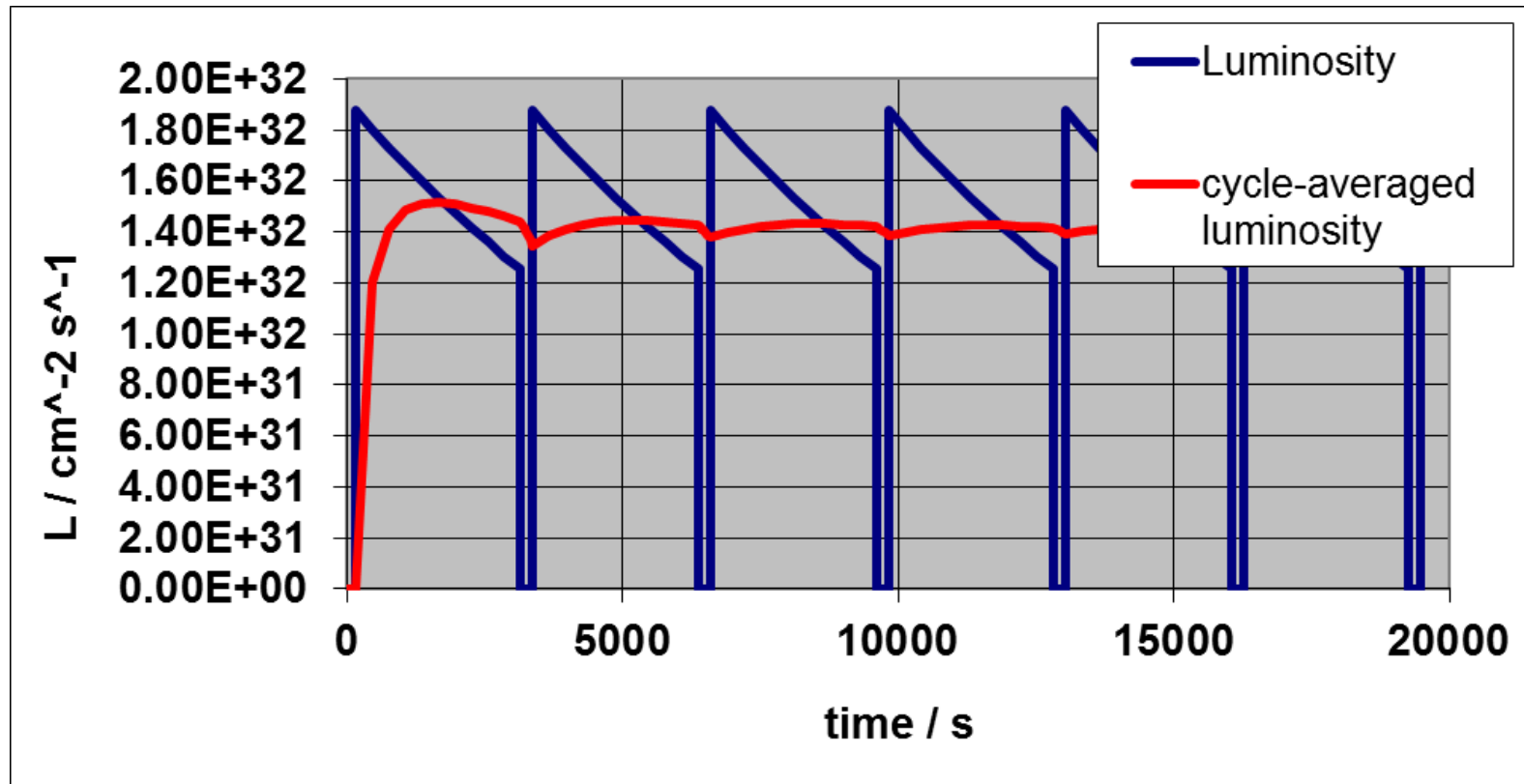
$p = 15 \text{ GeV}/c$

target thickness =  $4 \cdot 10^{15} \text{ cm}^{-2}$

→ 1/e-beam lifetime is 7500 s



# Luminosity for the HL mode



On the microscopic time scale the peak luminosity is 25% larger

$$\rightarrow L_{\text{peak}} \geq 2.4 \cdot 10^{32} \text{ cm}^{-2} \text{ s}^{-1}$$