BIB studies (IV)

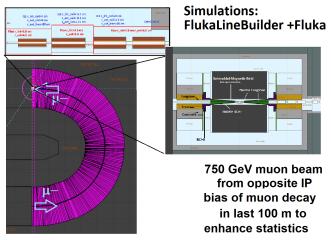
<u>Camilla Curatolo</u>*, Paola Sala, Francesco Collamati, Alessio Mereghetti, Donatella Lucchesi

> *Università e INFN Padova, Italy camilla.curatolo@pd.infn.it

> > February 16, 2021

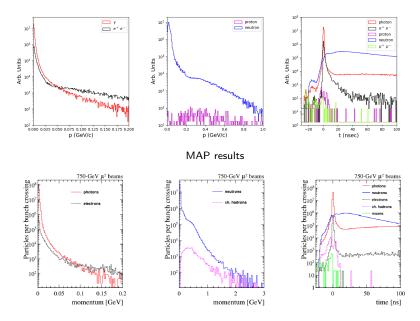
• Analysis of BIB obtained by μ^- beam of 2×10^{12} particles: comparison between our and MAP results @1.5 TeV CM energy

- MAP data simulated by MARS15
- Our framework:



• In the following graphs: time cut at 300 ns

Our results



Arb. Units

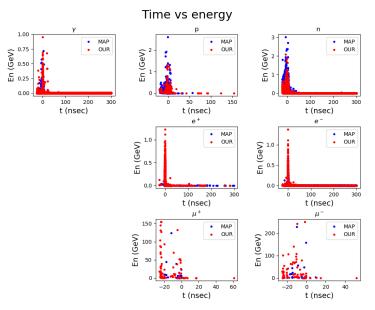
γ р n 10^{4} MAP: 4.02e+07 MAP: 2.23e+04 MAP: 4.10e+07 107 107 OUR: 3.91e+07 Arb. Units OUR: 4.54e+03 OUR: 4.76e+07 Arb. Units 103 105 105 10² 10³ 103 10¹ 10¹ 10¹ 0.00 0.75 0.00 0.25 0.50 0.75 0.0 1.0 1.5 0.25 0.50 1.00 1.00 0.5 2.0 En (GeV) En (GeV) En (GeV) e + е-MAP: 1.08e+05 MAP: 3.74e+05 OUR: 1.08e+06 OUR: 2.13e+06 Arb. Units Arb. Units 105 105 103 103 10¹ 10¹ 0.00 0.25 0.50 0.75 1.00 0.00 0.25 0.50 0.75 1.00 En (GeV) En (GeV) μ^+ μ^{-} 10³ MAP: 8.23e+02 MAP: 6.45e+02 OUR: 1.53e+03 Arb. Units OUR: 1.29e+03 Arb. Units 102 10² 10¹ 10¹ 100 150 200 50 100 150 200 0 50 0 En (GeV) En (GeV)

Energy distributions

γ р n 10⁸ 108 MAP: 4.02e+07 MAP: 2.23e+04 MAP: 4.10e+07 104 Arb. Units OUR: 3.91e+07 Arb. Units OUR: 4.54e+03 Arb. Units OUR: 4.76e+07 106 106 10³ 10² 104 104 10¹ 100 200 100 200 0 300 -25 Ó 25 50 75 Ó 300 t (nsec) t (nsec) t (nsec) e + е-MAP: 1.08e+05 MAP: 3.74e+05 OUR: 1.08e+06 OUR: 2.13e+06 Arb. Units Arb. Units 10⁵ 105 10³ 103 Sec. Sugar տ հնՈ 10¹ 10¹ ò 100 200 300 ò 100 200 300 t (nsec) t (nsec) μ^+ μ^{-} 10³ MAP: 8.23e+02 MAP: 6.45e+02 Arb. Units OUR: 1.53e+03 Arb. Units OUR: 1.29e+03 10² 10² 10¹ 10¹ -20 ò 20 -20 20 0 t (nsec) t (nsec)

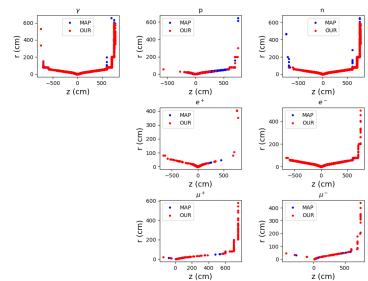
Time distributions

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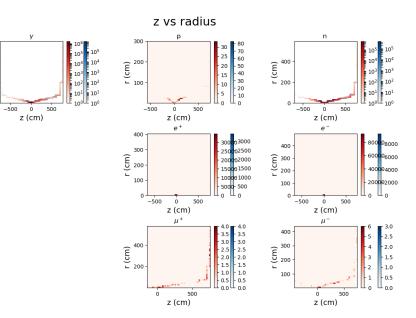
z vs radius

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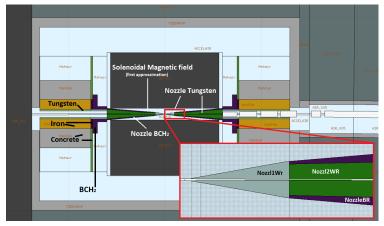
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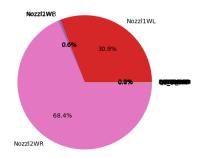
 \bullet Good agreement of our results obtained by LineBuilder+FLUKA and MAP results by means of MARS15

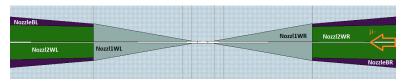
• Some more cosiderations regarding our results and a possible further optimization: analysis of position of particles exit and first interaction



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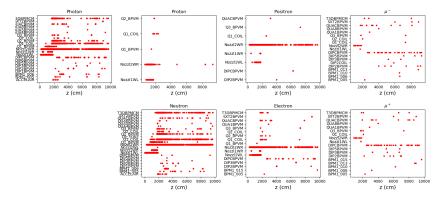
Part of the machine where the first interaction occurs after the muon dacay





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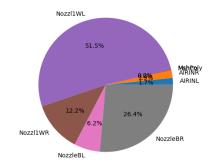
Distance of muon dacay against part of the machine where the first interaction occurs divided by kind of particle entering the detector

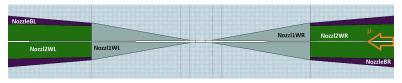


z vs first interaction

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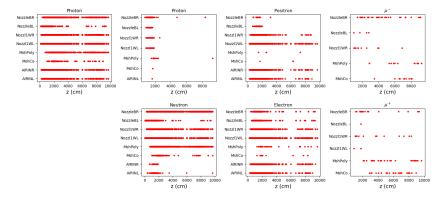
Part of the machine where the particles exit (entering the detector)





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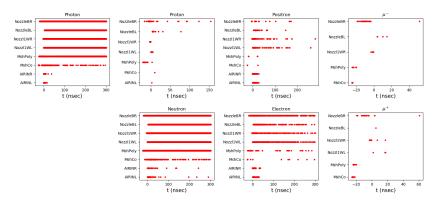
Distance with respect to IP of muon dacay against part of the machine where the particles exit divided by kind of particle entering the detector



z vs exit region

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Time of particle entering the detector with respect to bunch crossing against part of the machine where the particles exit divided by kind of particle entering the detector



time vs exit region

Histogram of the distance with respect to IP of muon dacay divided by kind of particle entering the detector

