
Bunch-by-bunch beam losses and collision patterns

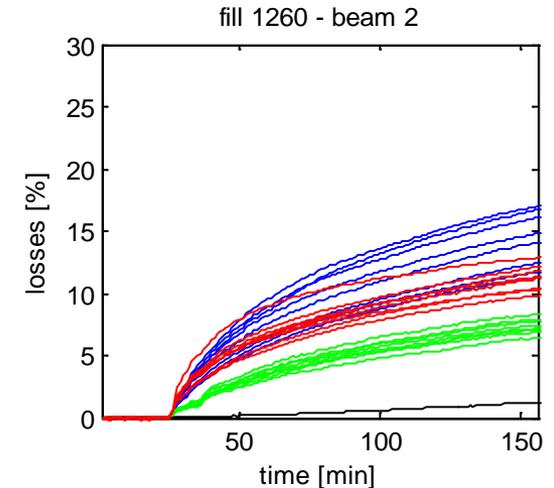
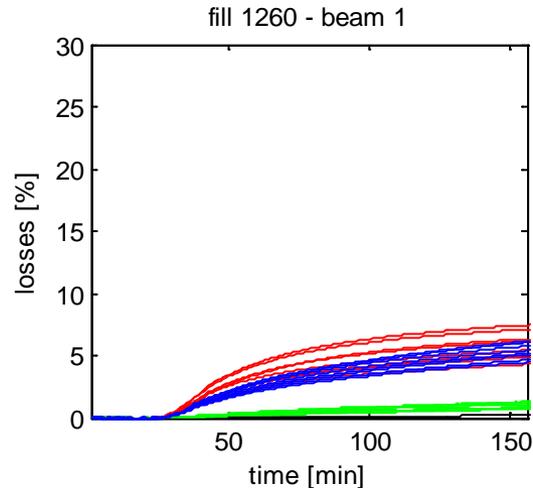
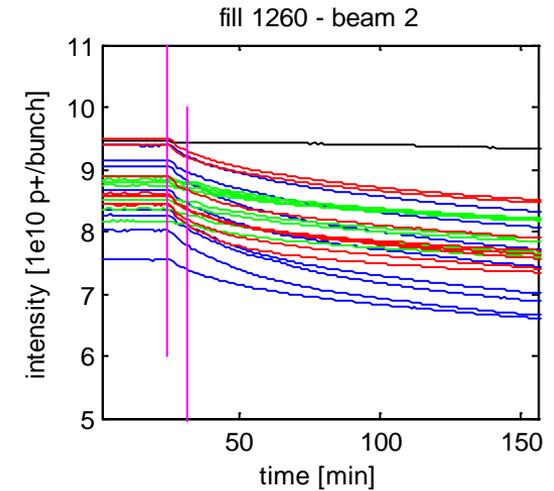
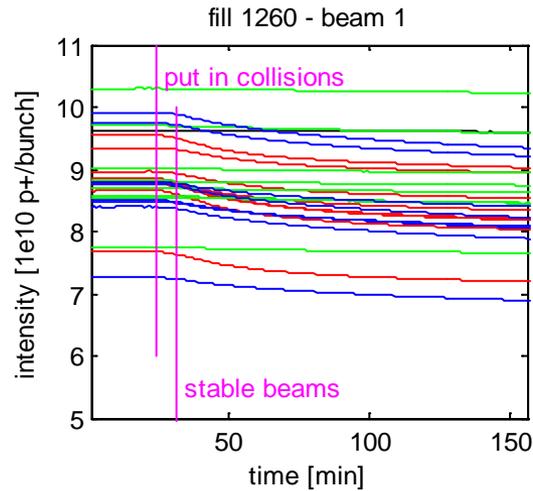
G. Papotti (observations)
and W. Herr (conclusions)

Introduction

- aim: relate bunch-by-bunch losses to collision patterns
- color coding:
 - black for witness bunches (zero collisions)
 - red for bunches colliding in IP 1, 5 and 2 (3 collisions)
 - blue for bunches colliding in IP 1, 5 and 8 (3 collisions)
 - green for bunches colliding in IP 2 and 8 (2 collisions)
- look at intensity bunch-by-bunch
- calculate percent loss
 - reference: 1st point of acquisition
- expected burnoff: $\sim 0.5e9$ /collision after 500 minutes

Fill 1260

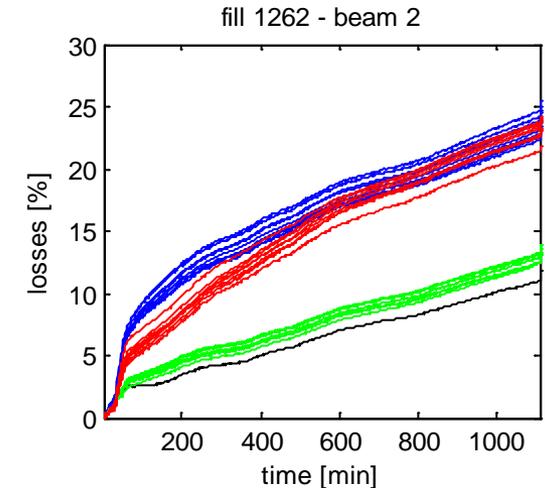
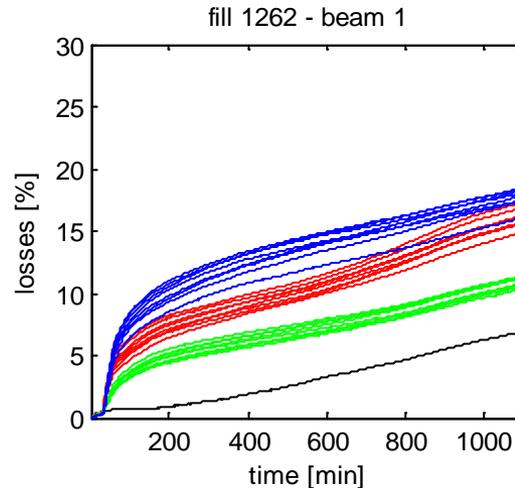
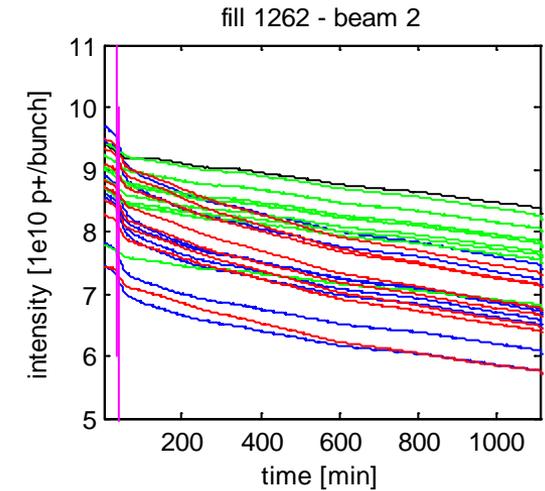
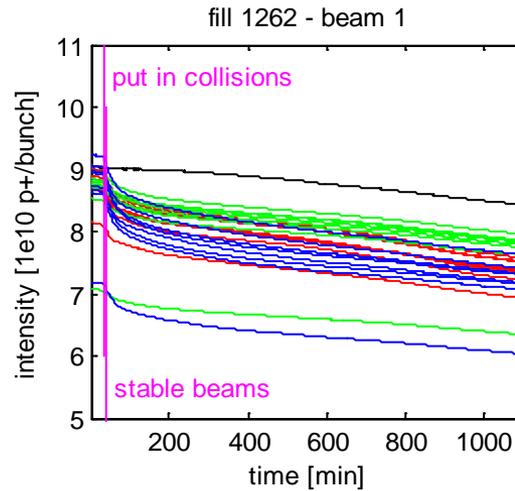
- 2 hours of stable beams
- inverted tune split
 - so far:
 - b1: -0.0025
 - b2: +0.0025
 - here:
 - b1: +0.0025
 - b2: -0.0025
- b2 now worse



IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1262

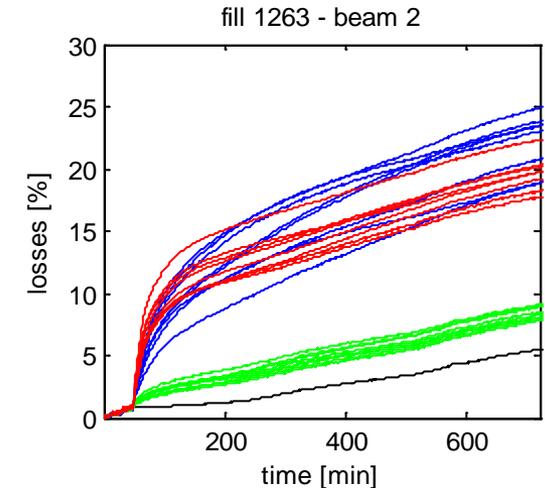
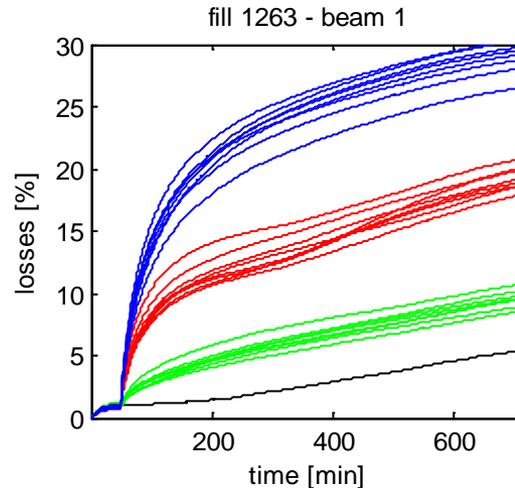
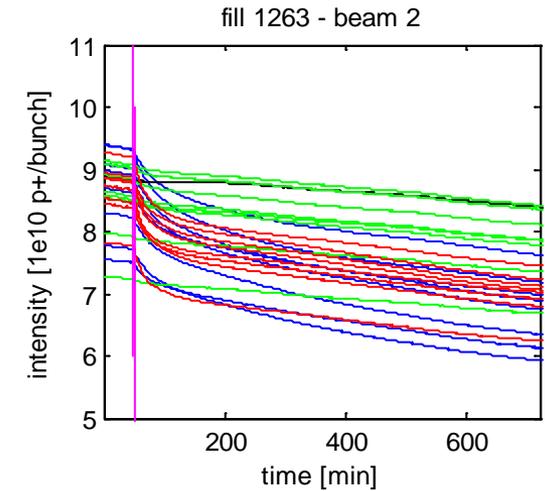
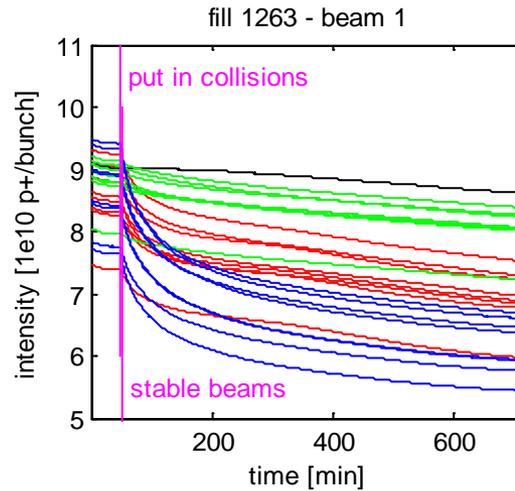
- 18 hours of stable beams
- no tune split
- b2 slightly worse
- witness b2 also loses



IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1263

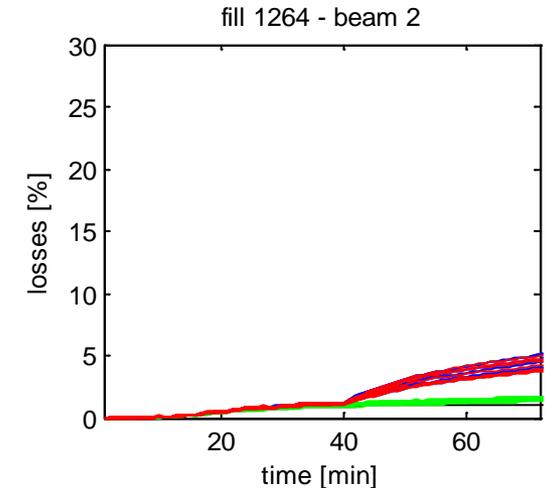
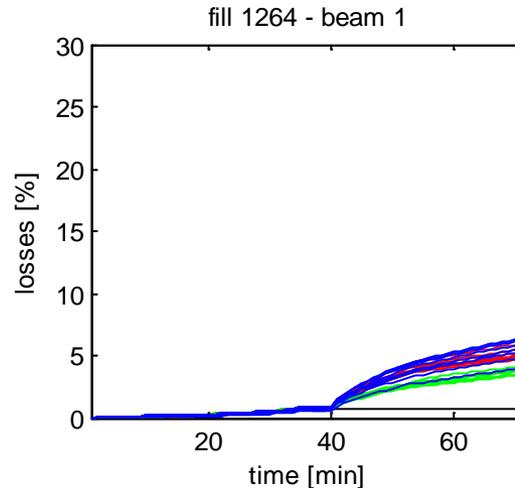
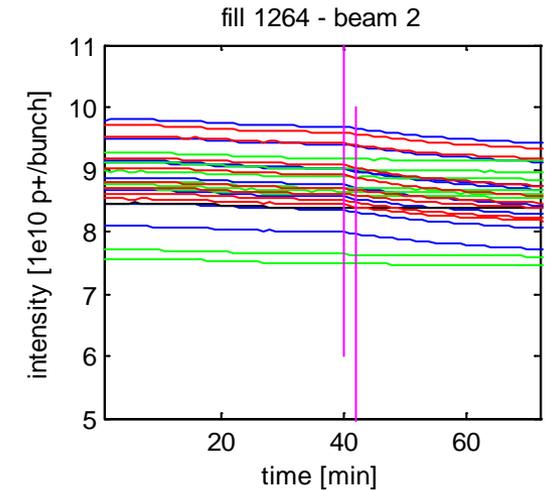
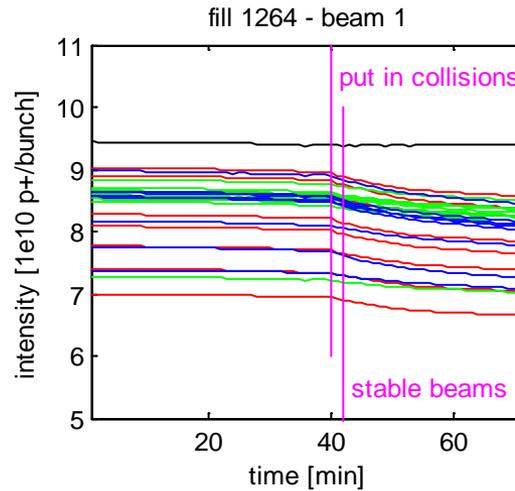
- >12 hours of stable beams
- tune +.002
 - both beams and planes
- b2 slightly worse
- witness b2 also loses



IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1264

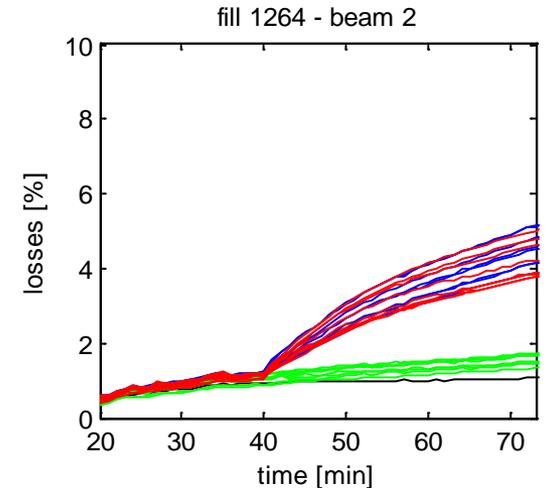
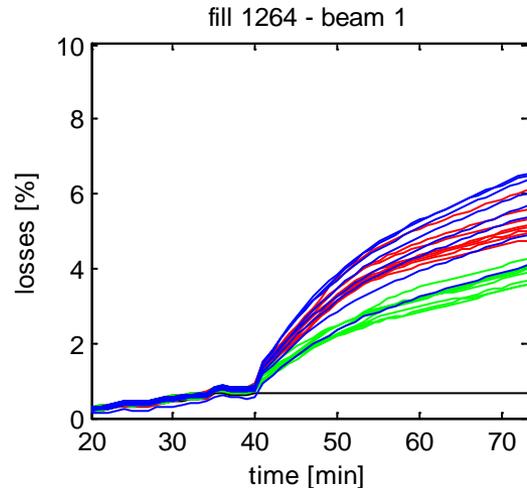
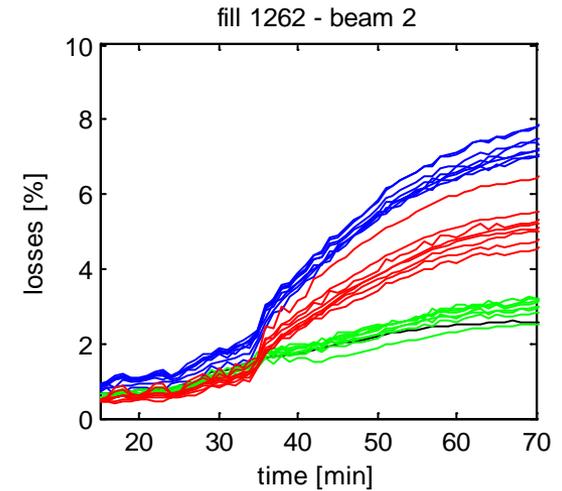
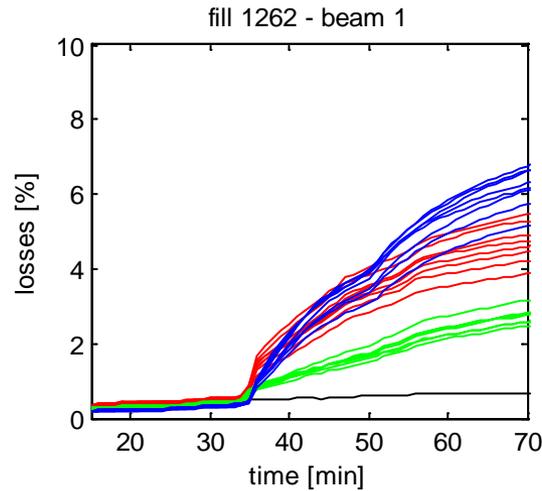
- >12 hours of stable beams
- tune v1: +0.003
 - after xing angle
- green b2 almost no losses
- witnesses no losses



IPs: 1 5 2 - 1 5 8 - 2 8

Fills 1262 vs 1264

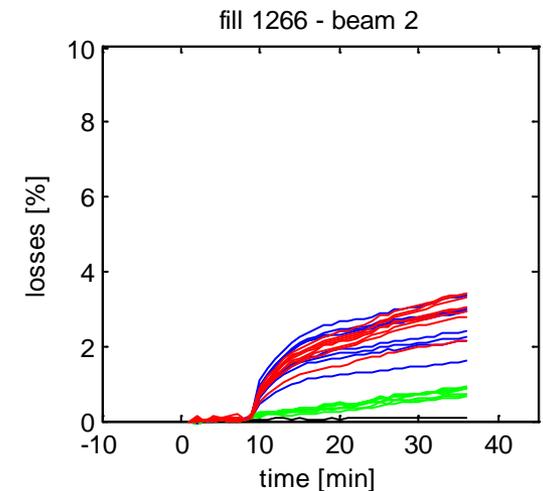
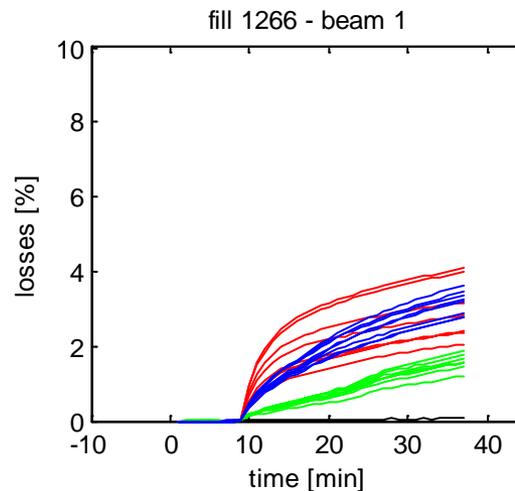
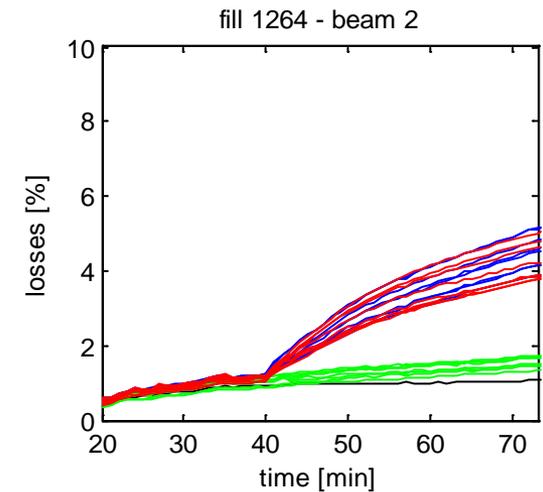
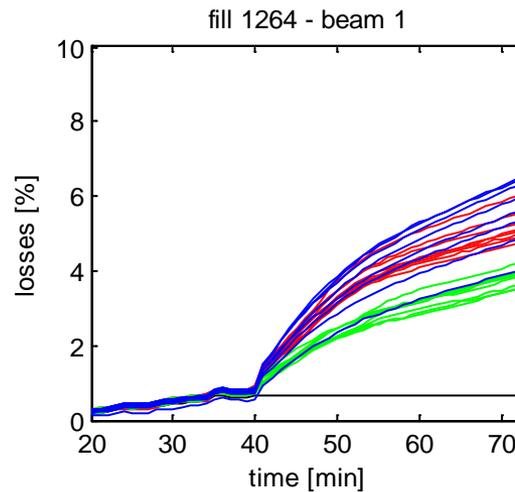
- best fills so far
- same time and vertical scales
- no tune change



IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1264 vs 1266

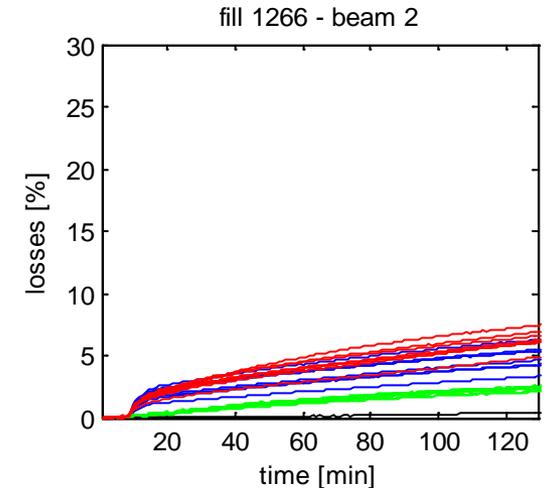
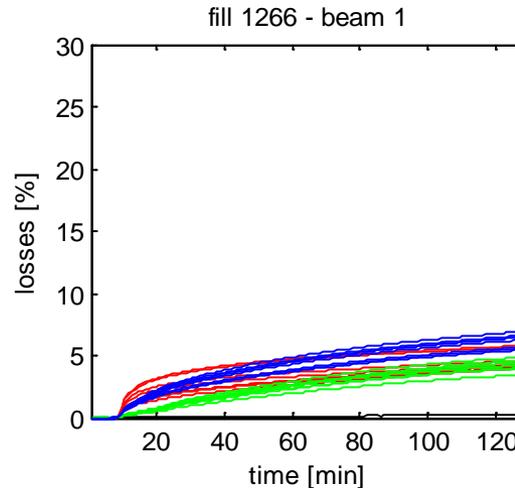
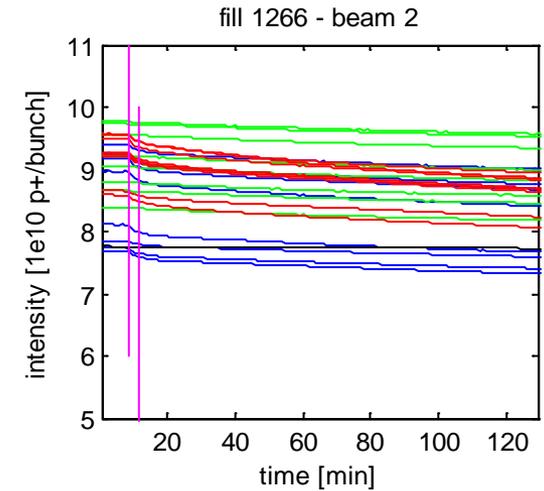
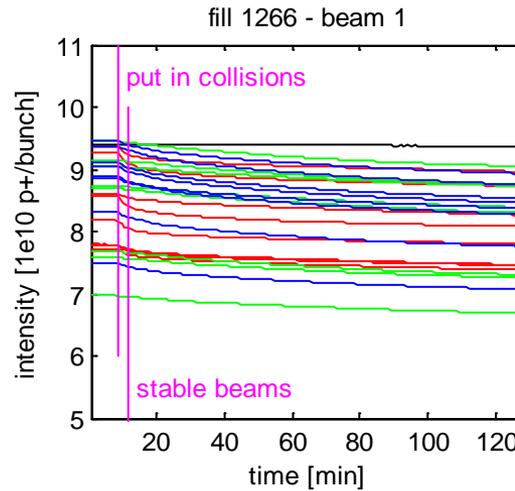
- best fills so far
- same time and vertical scales
- no tune change



IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1266

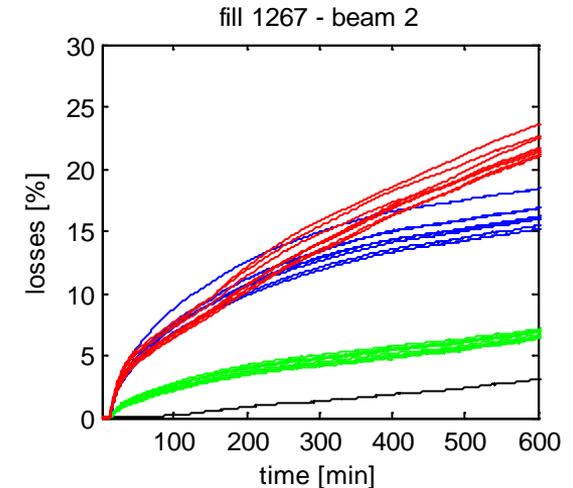
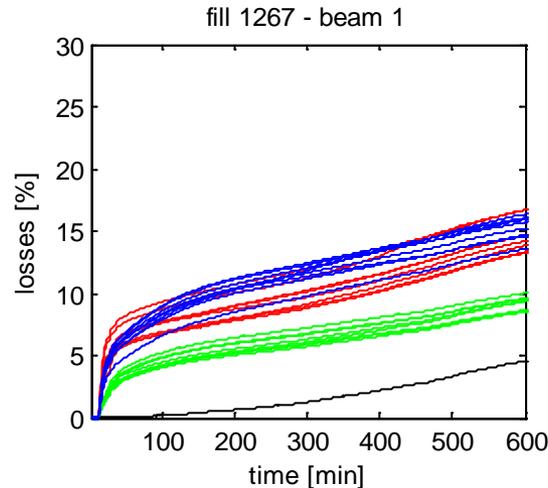
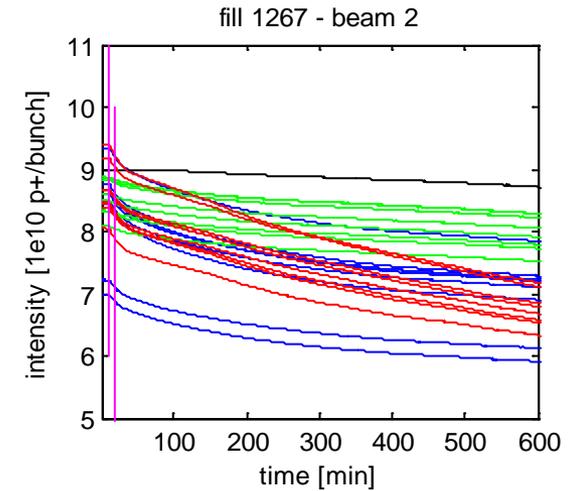
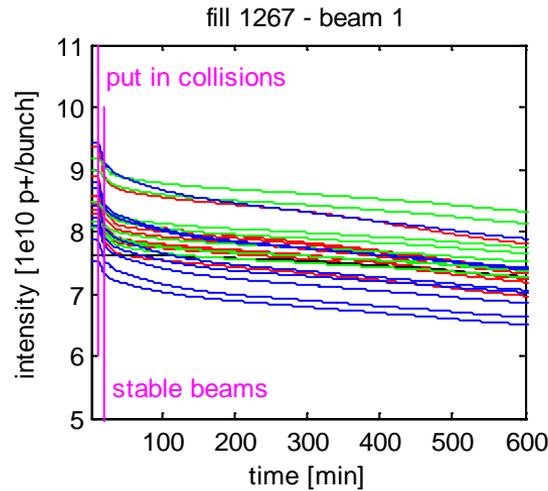
- 2 hours of stable beams
- nominal tunes
- max peak lumi
 - lowest emittances from SPS
- lowest losses so far



IPs: 1 5 2 - 1 5 8 - 2 8

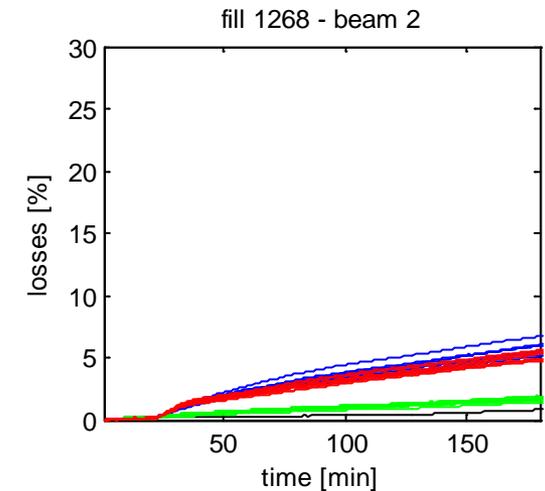
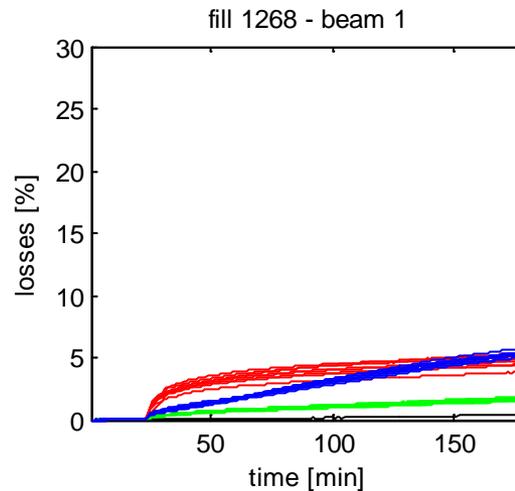
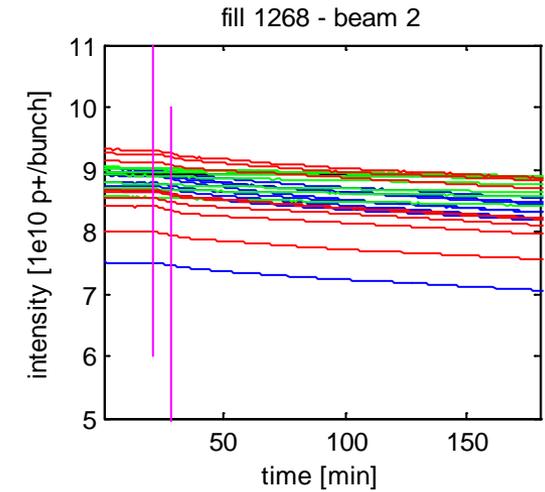
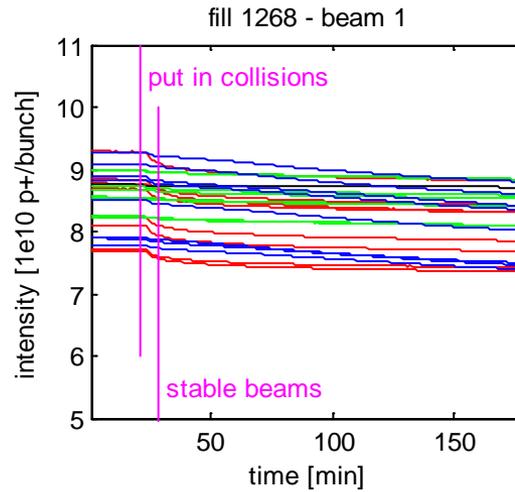
Fill 1267

- >10 hours of stable beams
- nominal tunes



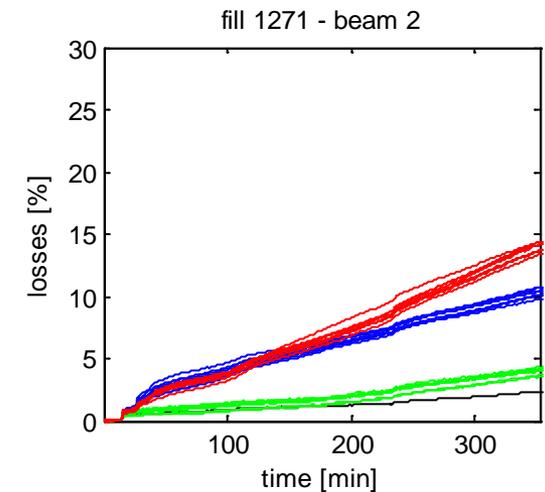
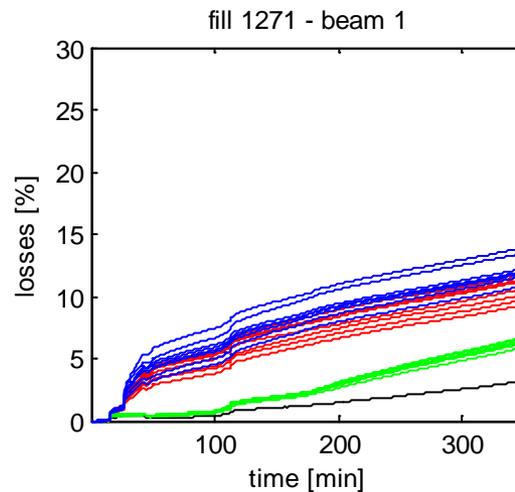
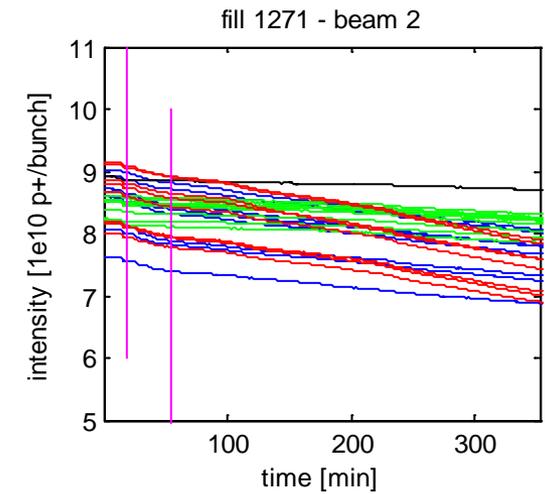
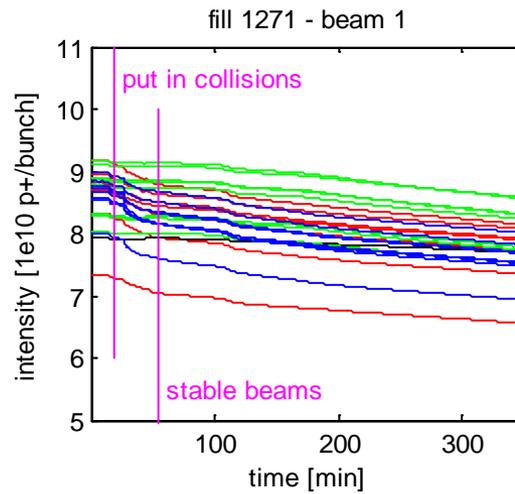
IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1268



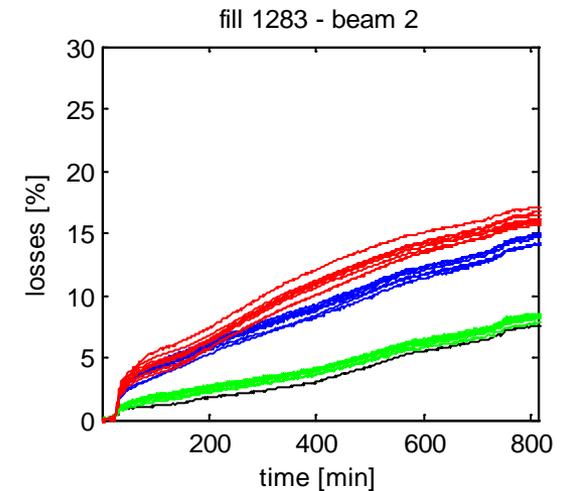
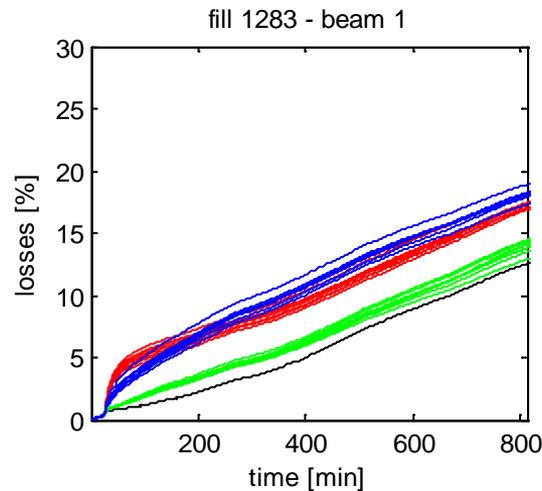
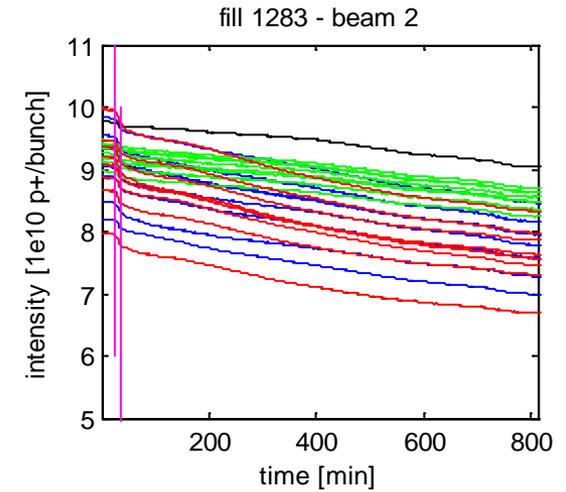
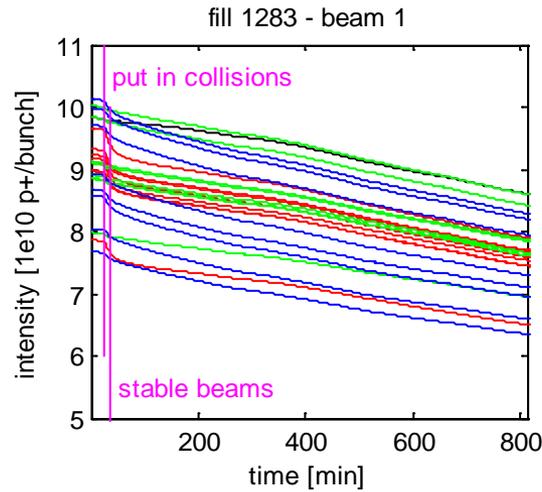
IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1271



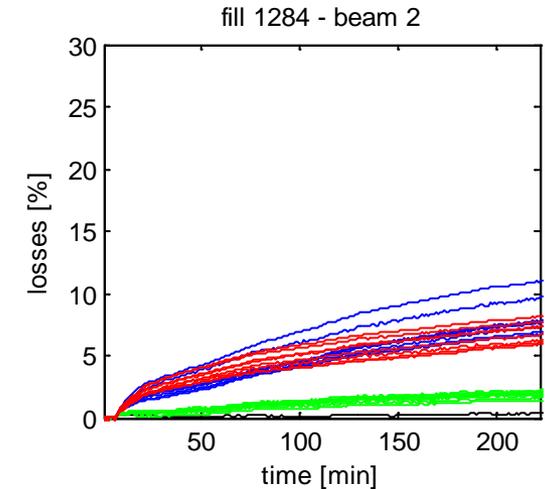
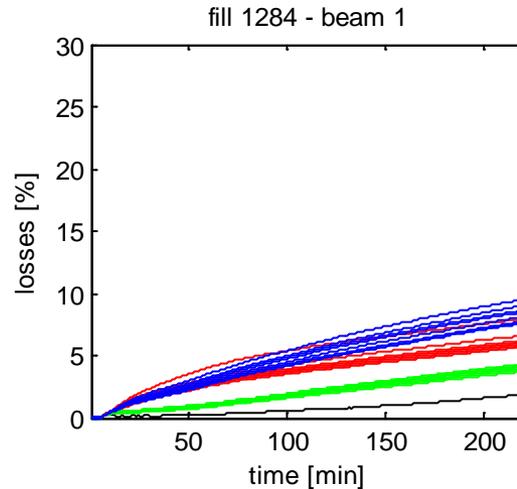
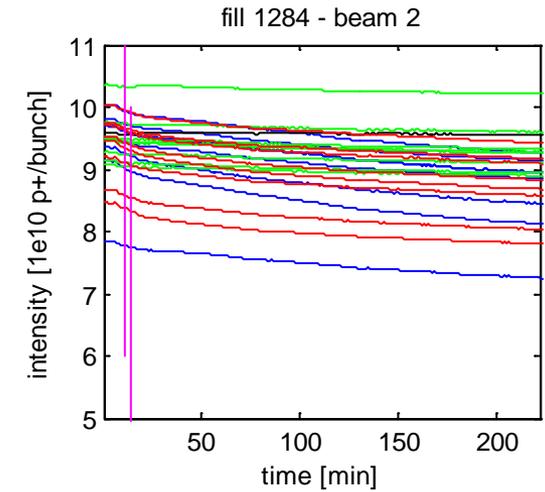
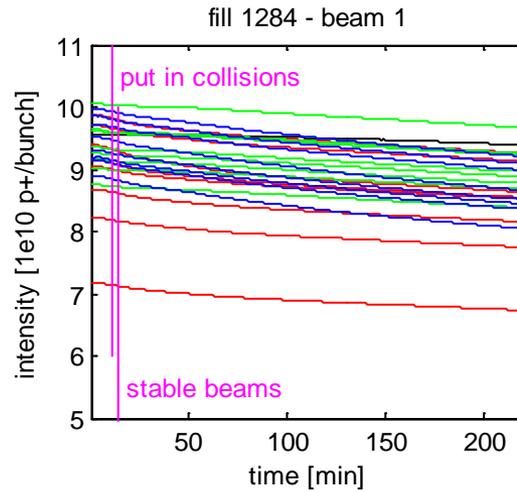
IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1283



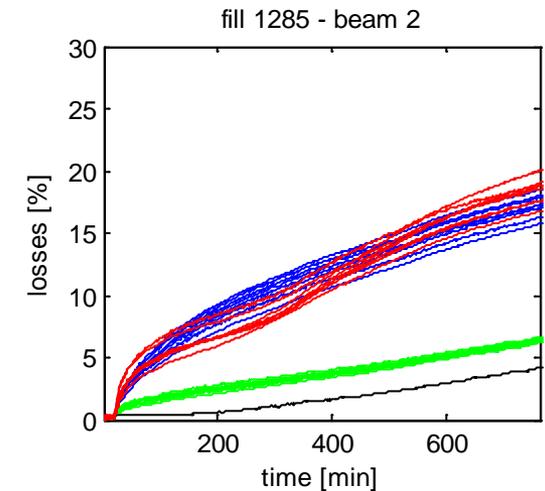
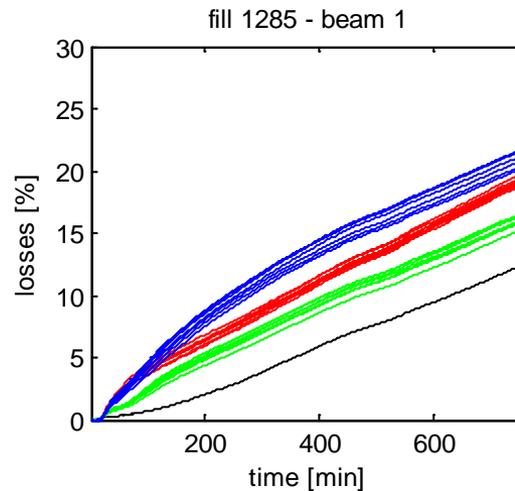
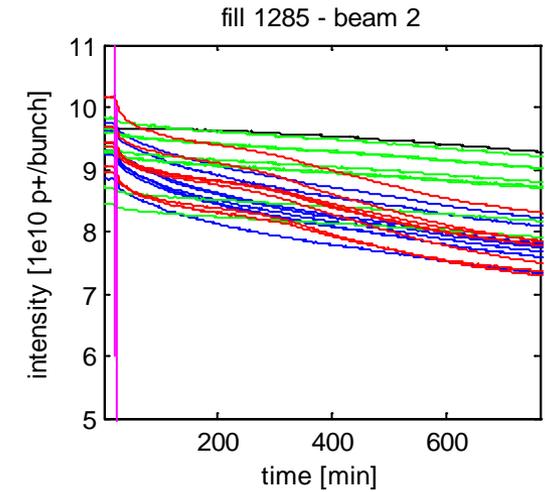
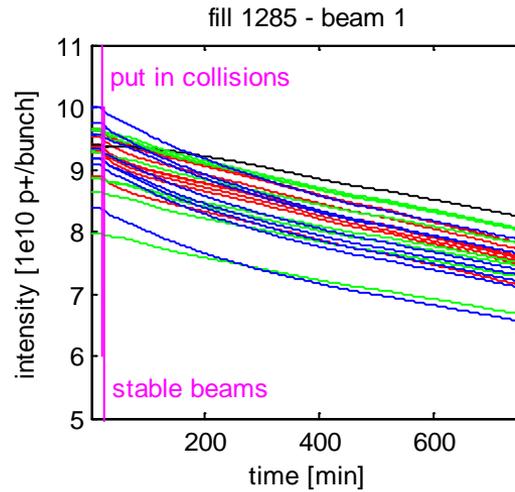
IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1284



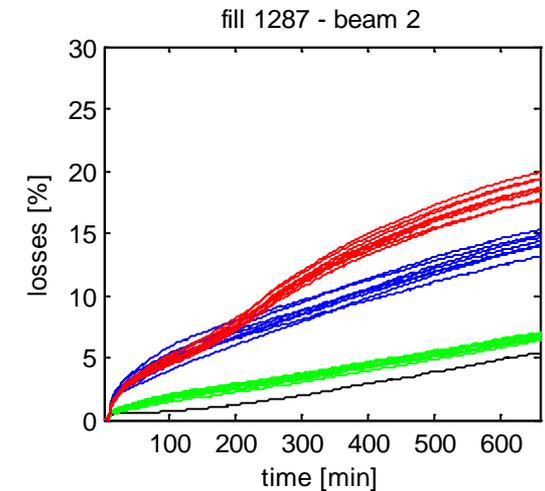
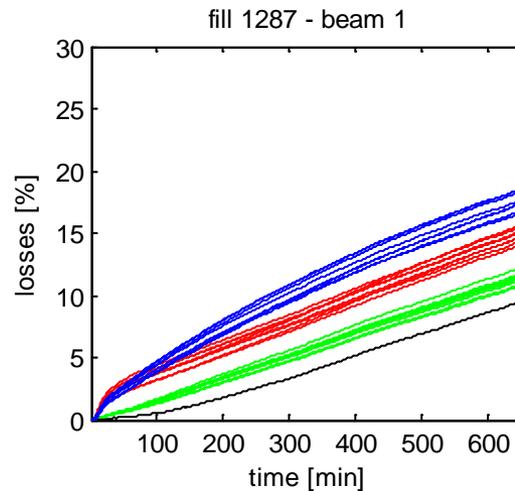
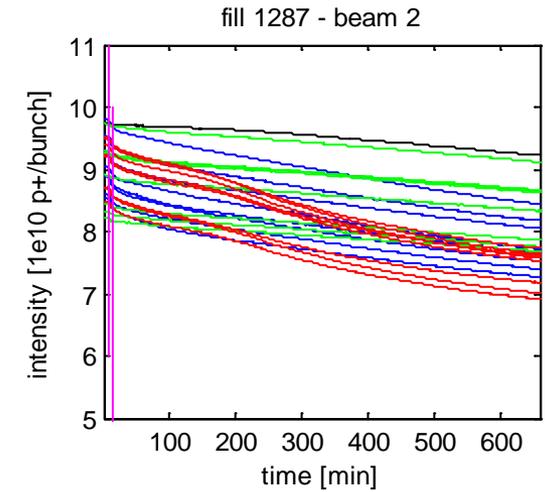
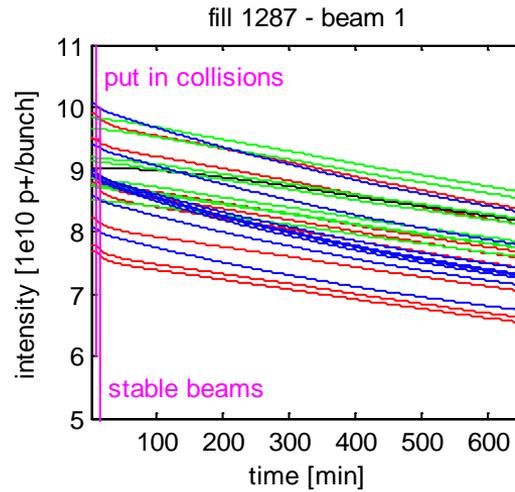
IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1285



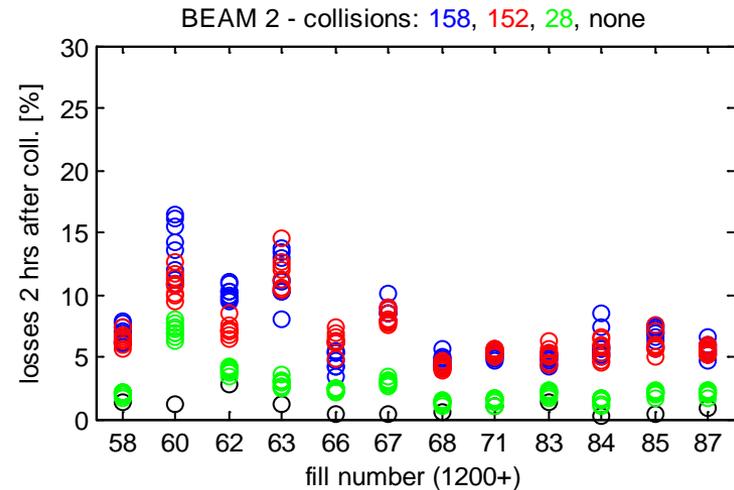
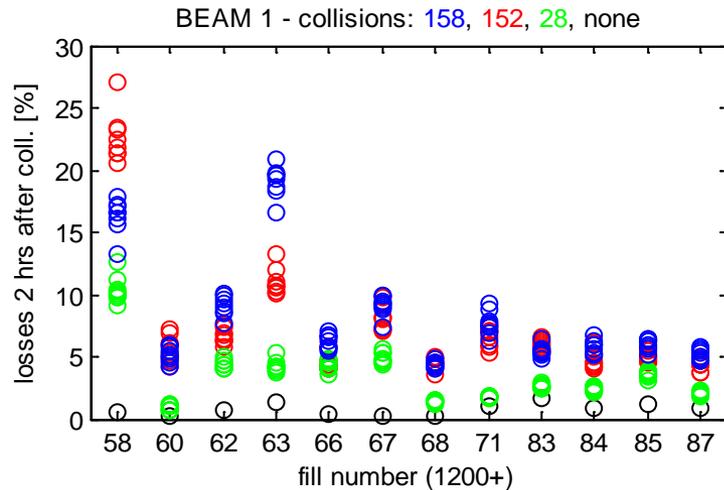
IPs: 1 5 2 - 1 5 8 - 2 8

Fill 1287



IPs: 1 5 2 - 1 5 8 - 2 8

Summary across different fills



- from fill 1264 nominal tunes
 - also 1262
- from fill 1266 chroma corrected after squeeze