

## Case Study 4.1: Pizza ? Just eat !

V.2.0



Two Piiza meals are shown in the following. Between the two examples lie about 1.5 years of user experience, and tuning the autoISF FCL using the emulator.

### Pizza w/ well tuned autoISF FCL

Home-made Pizza, size of an European baking oven rack (ALDI Süd dough roll) with canned tomatoes, salami, mozzarella, pre-fried eggplant, bell pepper, onions & garlic topping. I ate half of it for my ~12:15 h lunch.

FCL using Lyumjev (AAPS dev w/autoISF 2.2.8): The oref(1) SMB+UAM algo can deal very well with Pizza after autoISF gave 2 SMBs, together 4.8 U, at 12:33 + 12:38 PM.



The screenshot shows the 'Carbs and bolus' screen of a diabetes management app. It displays a list of insulin boluses with their timestamps, dosages, and types. A box highlights the two boluses administered at 12:33 PM and 12:38 PM.

| Time    | Dosage (U) | Type   |
|---------|------------|--------|
| 06:13PM | 0.20 U     | SMB PH |
| 05:13PM | 0.20 U     | SMB PH |
| 05:03PM | 0.40 U     | SMB PH |
| 04:58PM | 0.40 U     | SMB PH |
| 04:53PM | 0.10 U     | SMB PH |
| 04:28PM | 0.10 U     | SMB PH |
| 04:13PM | 0.40 U     | SMB PH |
| 04:03PM | 0.70 U     | SMB PH |
| 02:38PM | 1.70 U     | SMB PH |
| 02:23PM | 0.10 U     | SMB PH |
| 02:18PM | 0.80 U     | SMB PH |
| 01:18PM | 2.30 U     | SMB PH |
| 12:38PM | 3.00 U     | SMB PH |
| 12:33PM | 1.80 U     | SMB PH |
| 11:13AM | 1.20 U     | SMB PH |
| 11:08AM | 0.40 U     | SMB PH |
| 10:17AM | 0.10 U     | SMB PH |
| 10:13AM | 0.10 U     | SMB PH |
| 02:48AM | 0.80 U     | SMB PH |

No initial bolus given by me (1,2 U at 11:13 from automatic regulation towards the pre-lunch bg target of 74 mg/dl), and without any carb announcement.

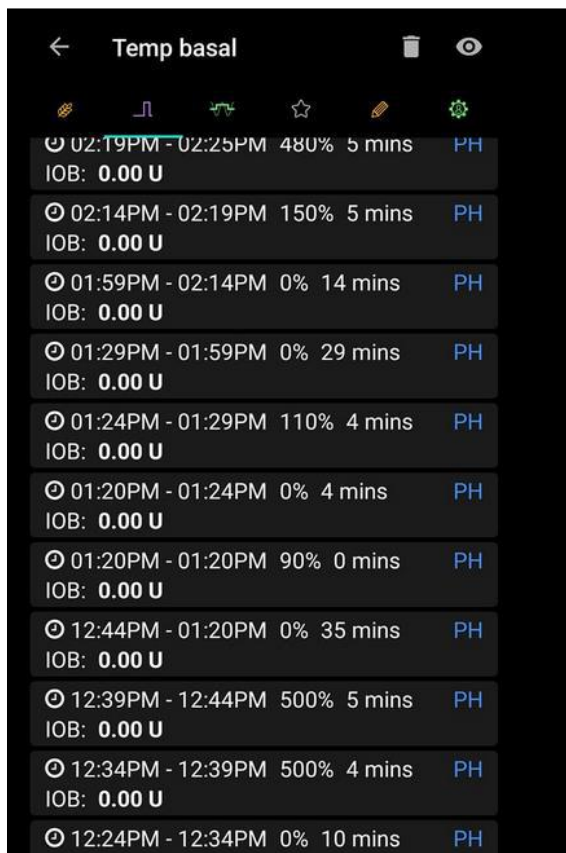
Note that TT 74 is automatically again set at steep rise starting again around 14:10 h.

With iob being back below iobTH then, 0.9 U of additional insulin is given (02:18 - 02:23)

Another TT 74 is automatically set after the one **jumpy CGM value** around 14:30, leading to 1,7 U (02:38 PM) additional insulin due to the „fake“ strong rise (a problem that is discussed further in [Case study 1.5](#)). This is made the situation risky with respect to going a bit too low between 17 and 18 h, and I had to watch out whether I need a snack, or whether I just get to a nice low starting bg for my dinner.

PS: The yellow graph on bottom of diagram 1 is the "carb deviation": As I did not tell my loop what I ate, it tells me back (calculates), what I „must have consumed“ that would explain the glucose development (in light of the calculated insulin decay).

In autoISF 3.0, iobTH is set via an iobTH\_percent of iobMAX in /Preferences



| Temp basal        |      |         |    |
|-------------------|------|---------|----|
| 02:19PM - 02:25PM | 480% | 5 mins  | PH |
| IOB: 0.00 U       |      |         |    |
| 02:14PM - 02:19PM | 150% | 5 mins  | PH |
| IOB: 0.00 U       |      |         |    |
| 01:59PM - 02:14PM | 0%   | 14 mins | PH |
| IOB: 0.00 U       |      |         |    |
| 01:29PM - 01:59PM | 0%   | 29 mins | PH |
| IOB: 0.00 U       |      |         |    |
| 01:24PM - 01:29PM | 110% | 4 mins  | PH |
| IOB: 0.00 U       |      |         |    |
| 01:20PM - 01:24PM | 0%   | 4 mins  | PH |
| IOB: 0.00 U       |      |         |    |
| 01:20PM - 01:20PM | 90%  | 0 mins  | PH |
| IOB: 0.00 U       |      |         |    |
| 12:44PM - 01:20PM | 0%   | 35 mins | PH |
| IOB: 0.00 U       |      |         |    |
| 12:39PM - 12:44PM | 500% | 5 mins  | PH |
| IOB: 0.00 U       |      |         |    |
| 12:34PM - 12:39PM | 500% | 4 mins  | PH |
| IOB: 0.00 U       |      |         |    |
| 12:24PM - 12:34PM | 0%   | 10 mins | PH |

12:38 PM my iobTH was first time exceeded  
=> Temp SMB shut-off, and "only"  
500%TBR (graph 3, 12:34 - :44).

12:44 PM basla was reduced to zero for half  
an hour, for satey reasons and to watch the  
further glucose development

01:18 PM iob had fallen below iobTH again,  
as more carbs of my pizza had required  
insulin. . Die nächste große (2,3 U) SMB  
kam

At 01:18 PM the next big (2.3 U) SMB was  
triggered, and iobTH was exceeded again.

The zig-zag shaped blue iob curve (lower part of diagram 1) shows nicely, how – over many hours – the loop was able to keep up sufficient iob for digesting the pizza, without – thanks to my set iobTH - ever shooting up into iob levels that would be unsafe for me.

Overall, this ended up as a day with 99% TIR.

### Pizza before all autoISF weights were properly tuned

About 1.5 years earlier, I had used a „standardized“ commercial type of Pizza to determine the various ISF\_weights.

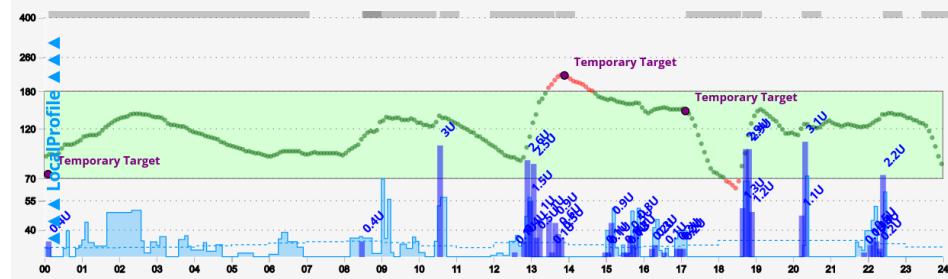
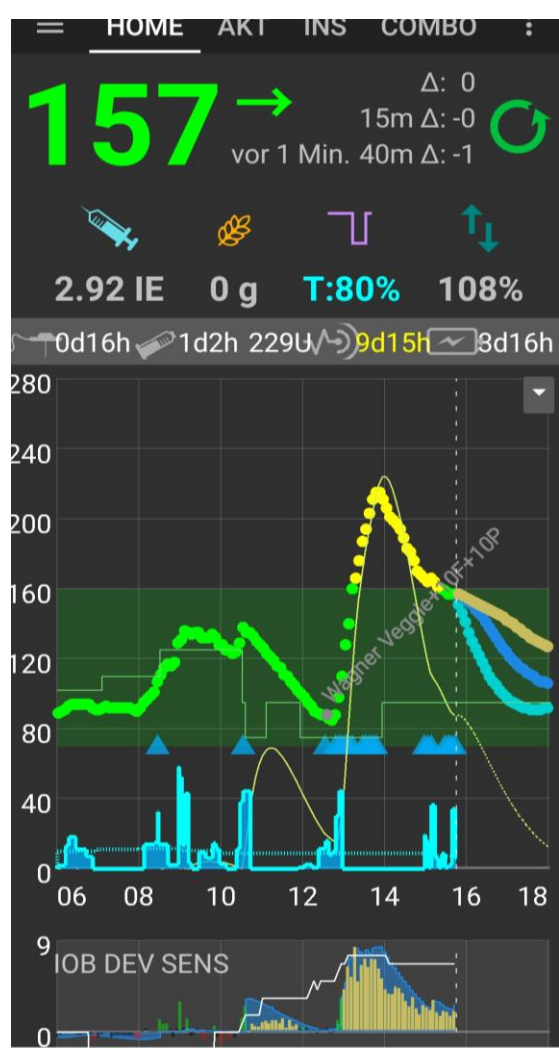
*After this experience*, the conclusion was that bgAccel\_ISF\_weight had to be strengthened, while pp\_ISF- and deltaISF\_weights needed to be softened for better results:

### The testing meal

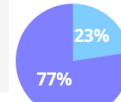
~ 12:30 PM: Wagner Veggie Pizza with extra ham + Mozzarella topping + red wine

15g fast carbs + 75 g other carbs + 34 g protein + 30 g fat

Very rapidly AAPS was building over 8 U of iob (graph on the left). Using about 6 U up (graph on the right) the glucose rise was within less than an hour after starting to eat in control. After over an hour pause, more SMBs were fired after 03 PM, as more carbs came to absorption from this greasy meal:



|                              |       |
|------------------------------|-------|
| <b>Bolus insulin:</b>        | 35.8U |
| Base basal insulin:          | 13.7U |
| Positive temp basal insulin: | 5.7U  |
| Negative temp basal insulin: | -9.0U |
| <b>Total basal insulin:</b>  | 10.5U |
| <b>Total daily insulin:</b>  | 46.3U |
| Total carbs:                 | 0 g   |
| Total protein:               | 0 g   |
| Total fat:                   | 0 g   |





After 05:30 PM (17:30) glucose sinks a bit too fast because a dogwalk coinciding with the „tail activity“ from the SMBs while nearly all carbs were digested

### How to improve settings: Analysis using the Emulator

Primary goal would be to limit the initial bg rise. But also the hypo tendency in the end is worrisome, and certainly should not increase further.

bgAccelISF\_weight drives the first SMBs that are best suited to limit initial rises of bg after meal start.

Limiting the peak height is also a good means to reduce hypo danger. Moreover, hypo danger very often emanates from „over“-treating either high bg level (bgISF\_weight) or duration (duralSF\_weight).

Lowering iobTH could be another measure against going low. However, we have seen the need for a high iob initially (when diet includes high carb foods).

A look into the effects of all the autoISF categories (and the underlying respective \_weights) should help coming to a hypothesis, how to shift weights for desired improvement.

In the following table (note: it is based on an older emulator and autoISF version):

- yellow markings: where stronger SMBs (lower resulting „ISF emul“)
- red markings, where weaker or no SMBs (higher „ISF emul“) would be desired

Findings:

- Autosense (grey: AS orig => ISF AS) is not helpful and should be switched off
- delta ISF weight seems way too strong and leads to lowered ISFs in times when we would like to reduce SMBs already (red marked, W 14-23). Moreover, delta\_ISF is responsible in lines 42 und 50 for an extra of 1.7 U that contributes to going low in the end of the investigated meal time window.
- Above the blue line (line 15, 13:02 MEZ, 12:02 Z) we minimum like to retain the sizes of SMBs. As we like to take down the delta\_ISF contributions, for keeping insulin supply for W12-15, we then must sharpen accel\_ISF (and autoISF\_max). To retain the SMB size like in AD12-15, an emulated ISF as in Y12-15 must result, with help from a lowered accel\_ISF (X12-15).

|    | D     | E   | F    | G    | K       | L      | M        | N        | O        | P        | Q     | R    | S    | T    | U    | V    | W     | X    | Y    | Z       | AD   | AE     |
|----|-------|-----|------|------|---------|--------|----------|----------|----------|----------|-------|------|------|------|------|------|-------|------|------|---------|------|--------|
| 1  |       |     |      | AS   | 5% rang | glu av | parabola | parabola | parabola | parabola | Accel | ISF  | ISF  | ISF  | ISF  | ISF  | ISF   | ISF  | ISF  | Ins.Req | SMB  | TBR    |
| 2  | MEZ   | bg  | iob  | orig | dura    | avg    | corr     | dura     | last-d   | next-d   | =O-N  | orig | prof | AS   | dura | high | delta | acce | emul | emul    | emul | emul   |
| 3  | 12:03 | 98  | 0,71 | 1,04 | 0       | 98     |          |          |          |          |       | 40   | 43   | 41,3 | 43   | 43   | 43    | 39,9 | 39,9 | -0,03   | 0    | 0,15   |
| 4  | 12:08 | 95  | 0,59 | 1,04 | 5       | 96,5   | 0,9981   | 15       | -2,8     | -3,3     | -0,5  | 43   | 43   | 41,3 | 43   | 43   | 43    | 44,8 | 43   | 0       | 0    | 0,165  |
| 5  | 12:13 | 93  | 0,47 | 1,05 | 10      | 95,3   | 0,9978   | 35       | -2,26    | -2,22    | 0,04  | 41   | 43   | 41   | 42,2 | 43   | 43    | 42,7 | 41   | -0,02   | 0    | 0,06   |
| 6  | 12:18 | 90  | 0,36 | 1,06 | 10      | 92,7   | 0,9979   | 40       | -2,43    | -2,43    | 0     | 41   | 43   | 40,6 | 42,2 | 43   | 43    | 43   | 40,6 | 0       | 0    | 0,055  |
| 7  | 12:23 | 89  | 0,27 | 1,05 | 15      | 91,8   | 0,9973   | 45       | -2,16    | -2,11    | 0,05  | 41   | 43   | 41   | 42,2 | 43   | 43    | 42,7 | 41   | 0,07    | 0    | 0,7175 |
| 8  | 12:27 | 88  | 0,23 | 1,06 | 15      | 90     | 0,9945   | 45       | -1,77    | -1,66    | 0,11  | 41   | 43   | 40,6 | 42,2 | 43   | 43    | 42,3 | 40,6 | 0,12    | 0    | 0,715  |
| 9  | 12:33 | 88  | 0,2  | 1,06 | 20      | 89,6   | 0,9936   | 30       | -0,29    | 0,29     | 0,58  | 40   | 43   | 40,6 | 41,7 | 43   | 43    | 39,6 | 39,6 | 0,2     | 0,1  | 0,983  |
| 10 | 12:38 | 86  | 0,29 | 1,06 | 20      | 88,2   | 0,9886   | 45       | -0,78    | -0,52    | 0,26  | 41   | 43   | 40,6 | 42,2 | 43   | 43    | 41,5 | 40,6 | 0       | 0    | 0,483  |
| 11 | 12:43 | 85  | 0,25 | 1,06 | 25      | 87,7   | 0,9877   | 45       | -0,54    | -0,27    | 0,27  | 41   | 43   | 40,6 | 41,7 | 43   | 43    | 41,4 | 40,6 | 0,02    | 0    | 0,623  |
| 12 | 12:48 | 88  | 0,22 | 1,06 | 30      | 87,7   | 0,9642   | 45       | 0,44     | 0,86     | 0,42  | 27   | 43   | 40,6 | 41,7 | 43   | 26,9  | 41,2 | 26,9 | 0,63    | 0,4  | 1,843  |
| 13 | 12:53 | 98  | 0,69 | 1,07 | 0       | 98     | 0,9959   | 15       | 9,41     | 14,91    | 5,5   | 22   | 43   | 40,2 | 43   | 43   | 14,3  | 23,3 | 21,5 | 4,09    | 2,6  | 5,5    |
| 14 | 12:58 | 110 | 3,42 | 1,08 | 0       | 110    | 0,9971   | 20       | 13,18    | 17,89    | 4,71  | 22   | 43   | 39,8 | 43   | 43   | 12,6  | 24,8 | 21,5 | 2,33    | 1,5  | 0      |
| 15 | 13:02 | 128 | 4,79 | 1,08 | 0       | 128    | 0,9991   | 15       | 17,2     | 21,2     | 4     | 21   | 41   | 38   | 41   | 41   | 8,9   | 25,1 | 20,5 | 3,85    | 2,5  | 0      |
| 16 | 13:08 | 140 | 7,09 | 1,09 | 0       | 140    | 0,9945   | 20       | 15,54    | 16,97    | 1,43  | 21   | 41   | 37,6 | 41   | 41   | 12,1  | 33,7 | 20,5 | 0,83    | 0,5  | 0      |
| 17 | 13:12 | 160 | 7,35 | 1,09 | 0       | 160    | 0,9971   | 25       | 17,97    | 19,76    | 1,79  | 21   | 41   | 37,6 | 41   | 41   | 8,2   | 32,1 | 20,5 | 1,654   | 1    | 0      |
| 18 | 13:18 | 166 | 8,04 | 1,09 | 5       | 163    | 0,9901   | 30       | 14,33    | 14,52    | 0,19  | 21   | 41   | 37,6 | 41   | 41   | 18,6  | 39,9 | 20,5 | -1,12   | 0    | 0      |
| 19 | 13:23 | 176 | 7,7  | 1,09 | 0       | 176    | 0,9921   | 25       | 8,69     | 6,4      | -2,29 | 25   | 41   | 37,6 | 41   | 41   | 13,7  | 49,3 | 24,7 | -1,46   | 0    | 0      |
| 20 | 13:28 | 187 | 7,32 | 1,09 | 0       | 187    | 0,9989   | 15       | 11,6     | 14,1     | 2,5   | 21   | 41   | 37,6 | 41   | 41   | 12,8  | 29,4 | 20,5 | 1,682   | 1    | 0      |
| 21 | 13:33 | 194 | 7,91 | 1,09 | 5       | 191    | 0,9973   | 15       | 8        | 6,5      | -1,5  | 23   | 41   | 37,6 | 41   | 41   | 17,1  | 46,4 | 23,2 | 0,3     | 0,1  | 0      |
| 22 | 13:38 | 203 | 7,58 | 1,09 | 5       | 199    | 0,9979   | 20       | 7,91     | 7,06     | -0,85 | 22   | 41   | 37,6 | 41   | 41   | 14,6  | 44   | 22   | 1,422   | 0,9  | 0      |
| 23 | 13:38 | 203 | 7,55 | 1,09 | 5       | 200    | 0,9979   | 20       | 7,91     | 7,06     | -0,85 | 22   | 41   | 37,6 | 41   | 41   | 14,6  | 44   | 22   | 1,447   | 0,9  | 0      |
| 24 | 13:43 | 211 | 8,03 | 1,09 | 5       | 206    | 0,9986   | 15       | 8,6      | 9,1      | 0,5   | 21   | 41   | 37,6 | 41   | 41   | 15,8  | 38   | 20,5 | 0,975   | 0,6  | 0      |
| 25 | 13:48 | 215 | 8,15 | 1,09 | 10      | 208    | 0,9983   | 15       | 4,6      | 2,1      | -2,5  | 28   | 41   | 37,6 | 36,6 | 41   | 22,8  | 51   | 28,4 | 0,852   | 0,5  | 0      |
| 26 | 13:53 | 215 | 8,16 | 1,09 | 15      | 209    | 1        | 15       | 0        | -4       | -4    | 51   | 41   | 37,6 | 34,7 | 41   | 41    | 60,3 | 51,1 | -0,8    | 0    | 0      |
| 27 | 13:53 | 215 | 8,11 | 1,09 | 10      | 214    | 1        | 15       | 0        | -4       | -4    | 53   | 41   | 37,6 | 37,6 | 41   | 41    | 60,3 | 55,3 | -1,25   | 0    | 0      |
| 28 | 13:57 | 211 | 7,66 | 1,09 | 20      | 210    | 1        | 15       | -4       | -8       | -4    | 51   | 41   | 37,6 | 35   | 41   | 41    | 60,3 | 51,5 | -1,36   | 0    | 0      |
| 29 | 14:03 | 206 | 7,15 | 1,09 | 25      | 210    | 0,9937   | 30       | -6,21    | -9,5     | -3,29 | 44   | 40   | 36,7 | 33,1 | 40   | 40    | 53,1 | 43,7 | 0       | 0    | 0      |
| 30 | 14:07 | 201 | 6,66 | 1,08 | 30      | 209    | 0,9995   | 15       | -5,2     | -5,7     | -0,5  | 33   | 40   | 37   | 32   | 40   | 40    | 41,7 | 33,2 | 0       | 0    | 0      |



|    | D     | E   | F    | G    | K            | L        | M        | N        | O        | P      | Q     | R    | S    | T    | U    | V    | W     | X    | Y       | Z     | AD   | AE     |
|----|-------|-----|------|------|--------------|----------|----------|----------|----------|--------|-------|------|------|------|------|------|-------|------|---------|-------|------|--------|
| 1  |       |     |      | AS   | 5% ranglu av | parabola | parabola | parabola | parabola | Accel  | ISF   | ISF  | ISF  | ISF  | ISF  | ISF  | ISF   | ISF  | Ins.Req | SMB   | TBR  |        |
| 2  | MEZ   | bg  | iob  | orig | dura         | avg      | corr     | dura     | last-d   | next-d | =O-N  | orig | prof | AS   | dura | high | delta | acce | emul    | emul  | emul |        |
| 31 | 14:13 | 199 | 6,17 | 1,08 | 15           | 204      | 0,9948   | 15       | -2,6     | -1,1   | 1,5   | 33   | 40   | 37   | 35,7 | 40   | 40    | 32,6 | 32,6    | 0     | 0    | 0      |
| 32 | 14:18 | 197 | 5,69 | 1,08 | 15           | 201      | 0,996    | 20       | -1,57    | -0,29  | 1,28  | 33   | 40   | 37   | 35,7 | 40   | 40    | 33,4 | 33,4    | 0     | 0    | 0      |
| 33 | 14:23 | 194 | 5,22 | 1,08 | 20           | 199      | 0,9981   | 15       | -2,8     | -3,3   | -0,5  | 36   | 40   | 37   | 34,5 | 40   | 40    | 41,6 | 36      | 0     | 0    | 0      |
| 34 | 14:27 | 189 | 4,77 | 1,08 | 20           | 196      | 0,9991   | 15       | -4,8     | -6,3   | -1,5  | 40   | 40   | 37   | 34,8 | 40   | 40    | 45,4 | 39,5    | 0     | 0    | 0      |
| 35 | 14:33 | 183 | 4,35 | 1,08 | 25           | 194      | 0,9997   | 20       | -6,14    | -7,57  | -1,43 | 38   | 40   | 37   | 33,9 | 40   | 40    | 45,1 | 38,1    | 0     | 0    | 0      |
| 36 | 14:37 | 181 | 3,94 | 1,08 | 10           | 184      | 0,9881   | 15       | -3       | -1,5   | 1,5   | 33   | 40   | 37   | 37,4 | 40   | 40    | 33   | 33      | 0     | 0    | 0      |
| 37 | 14:42 | 176 | 3,56 | 1,08 | 10           | 180      | 0,9891   | 40       | -4,64    | -4,91  | -0,27 | 38   | 40   | 37   | 37,7 | 40   | 40    | 40,8 | 37,8    | 0     | 0    | 0      |
| 38 | 14:47 | 170 | 3,19 | 1,08 | 15           | 178      | 0,998    | 15       | -6,4     | -8,4   | -2    | 43   | 40   | 37   | 36,7 | 40   | 40    | 47,4 | 43,4    | 0     | 0    | 0      |
| 39 | 14:53 | 168 | 2,85 | 1,08 | 10           | 171      | 0,9915   | 35       | -4,19    | -4,14  | 0,05  | 37   | 40   | 37   | 37,7 | 40   | 40    | 39,7 | 37      | -0,22 | 0    | 0      |
| 40 | 14:57 | 166 | 2,53 | 1,08 | 15           | 170      | 0,9918   | 20       | -1,66    | -0,23  | 1,43  | 33   | 40   | 37   | 37   | 40   | 40    | 33,1 | 33,1    | 0,3   | 0,1  | 1,194  |
| 41 | 15:02 | 164 | 2,42 | 1,08 | 15           | 167      | 1        | 15       | -2       | -2     | 0     | 37   | 40   | 37   | 37   | 40   | 40    | 37   | 37      | 0,3   | 0,1  | 0,06   |
| 42 | 15:07 | 166 | 2,25 | 1,08 | 20           | 167      | 0,989    | 30       | 0,67     | 1,98   | 1,31  | 29   | 40   | 37   | 36   | 40   | 28,6  | 33,7 | 28,6    | 1,4   | 0,9  | 3,286  |
| 43 | 15:12 | 164 | 3,08 | 1,08 | 25           | 166      | 0,9826   | 45       | 0,02     | 0,73   | 0,71  | 35   | 40   | 37   | 35,4 | 40   | 40    | 36,6 | 35,3    | 0     | 0    | 0,406  |
| 44 | 15:17 | 161 | 2,86 | 1,08 | 30           | 166      | 0,9647   | 15       | -3,6     | -6,1   | -2,5  | 40   | 40   | 37   | 34,5 | 40   | 40    | 45,9 | 39,6    | 0     | 0    | 0,026  |
| 45 | 15:23 | 160 | 2,61 | 1,08 | 35           | 165      | 0,9802   | 15       | -1,6     | -1,1   | 0,5   | 34   | 40   | 37   | 33,9 | 40   | 40    | 37,6 | 33,8    | 0,03  | 0    | 0,546  |
| 46 | 15:27 | 159 | 2,42 | 1,08 | 40           | 164      | 0,9866   | 20       | -0,94    | -0,37  | 0,57  | 33   | 40   | 37   | 33,1 | 40   | 40    | 37,1 | 33,1    | 0,27  | 0,1  | 0,03   |
| 47 | 15:32 | 157 | 2,29 | 1,08 | 45           | 164      | 0,9943   | 15       | -1,8     | -2,3   | -0,5  | 34   | 40   | 37   | 32,5 | 40   | 40    | 41,6 | 33,7    | 0,24  | 0,1  | 0,13   |
| 48 | 15:38 | 157 | 2,18 | 1,08 | 50           | 163      | 0,9857   | 30       | -0,64    | -0,29  | 0,35  | 32   | 40   | 37   | 31,7 | 40   | 40    | 38,1 | 31,8    | 0,82  | 0,5  | 2,126  |
| 49 | 15:43 | 157 | 2,63 | 1,08 | 50           | 162      | 0,987    | 35,2     | -0,13    | 0,26   | 0,39  | 32   | 40   | 37   | 32   | 40   | 40    | 37,9 | 31,9    | 0,6   | 0,3  | 0,37   |
| 50 | 15:47 | 159 | 2,75 | 1,08 | 55           | 162      | 0,9723   | 40       | 0,77     | 1,27   | 0,5   | 29   | 40   | 37   | 31,3 | 40   | 28,6  | 37,8 | 28,6    | 1,33  | 0,8  | 3,146  |
| 51 | 15:53 | 158 | 3,52 | 1,08 | 60           | 161      | 0,9616   | 45       | 0,89     | 1,32   | 0,43  | 31   | 40   | 37   | 30,8 | 40   | 40    | 38,4 | 30,7    | -0,03 | 0    | 0      |
| 52 | 15:58 | 151 | 3,29 | 1,08 | 60           | 160      | 0,9893   | 14,8     | -6,44    | -11,04 | -4,6  | 46   | 40   | 37   | 30,8 | 40   | 40    | 59,6 | 46      | 0     | 0    | 0      |
| 53 | 16:03 | 145 | 3,06 | 1,07 | 5            | 148      | 0,9808   | 15       | -7,41    | -9,92  | -2,51 | 44   | 39   | 36,4 | 39   | 39   | 39    | 46,6 | 43,5    | 0     | 0    | 0      |
| 54 | 16:08 | 142 | 2,83 | 1,07 | 5            | 144      | 0,9987   | 15       | -3,39    | -1,38  | 2,01  | 30   | 39   | 36,4 | 39   | 39   | 39    | 29,6 | 29,6    | 0     | 0    | 0      |
| 55 | 16:12 | 145 | 2,6  | 1,07 | 15           | 146      | 0,9895   | 15       | 2,4      | 6,9    | 4,5   | 24   | 39   | 36,4 | 36,8 | 39   | 24,4  | 23,7 | 23,7    | 0,42  | 0,2  | 1,3536 |
| 56 | 16:17 | 148 | 2,68 | 1,07 | 20           | 146      | 0,9831   | 25       | 4,12     | 7,2    | 3,08  | 24   | 39   | 36,4 | 36,1 | 39   | 24,4  | 27,7 | 24,4    | 0,61  | 0,3  | 1,7336 |
| 57 | 16:22 | 149 | 2,9  | 1,07 | 25           | 147      | 0,9933   | 15       | 1,4      | 0,4    | -1    | 35   | 39   | 36,4 | 35,5 | 39   | 32,5  | 42,1 | 35,1    | 0     | 0    | 0,2936 |
| 58 | 16:27 | 150 | 2,7  | 1,07 | 30           | 147      | 0,9947   | 20       | 0,72     | -0,14  | -0,86 | 35   | 39   | 36,4 | 34,8 | 39   | 32,5  | 41,7 | 34,8    | -0,14 | 0    | 0      |

|    | D     | E   | F    | G    | K            | L        | M        | N        | O        | P      | Q     | R    | S    | T    | U    | V    | W     | X    | Y        | Z     | AD   | AE     |
|----|-------|-----|------|------|--------------|----------|----------|----------|----------|--------|-------|------|------|------|------|------|-------|------|----------|-------|------|--------|
| 1  |       |     |      | AS   | 5% ranglu av | parabola | parabola | parabola | parabola | Accel  | ISF   | ISF  | ISF  | ISF  | ISF  | ISF  | ISF   | ISF  | Ins.Requ | SMB   | TBR  |        |
| 2  | MEZ   | bg  | iob  | orig | dura         | avg      | corr     | dura     | last-d   | next-d | =O-N  | orig | prof | AS   | dura | high | delta | acce | emul     | emul  | emul |        |
| 59 | 16:32 | 151 | 2,48 | 1,07 | 35           | 148      | 1        | 15       | 1        | 1      | 0     | 33   | 39   | 36,4 | 34,2 | 39   | 32,5  | 39   | 32,5     | 0,25  | 0,1  | 0,36   |
| 60 | 16:37 | 150 | 2,39 | 1,07 | 40           | 148      | 0,9909   | 30       | -0,43    | -1,14  | -0,71 | 36   | 39   | 36,4 | 33,6 | 39   | 39    | 41,1 | 35,5     | -0,23 | 0    | 0      |
| 61 | 16:43 | 148 | 2,18 | 1,07 | 45           | 148      | 0,9896   | 15       | -2,2     | -3,7   | -1,5  | 37   | 39   | 36,4 | 33,1 | 39   | 39    | 43,7 | 37,1     | 0     | 0    | 0      |
| 62 | 16:48 | 148 | 1,97 | 1,07 | 50           | 148      | 0,9651   | 40       | -1,72    | -2,4   | -0,68 | 34   | 39   | 36,4 | 32,5 | 39   | 39    | 40,4 | 33,8     | 0,15  | 0    | 0,8136 |
| 63 | 16:52 | 148 | 1,84 | 1,07 | 55           | 148      | 0,9426   | 20       | 0,06     | 0,62   | 0,56  | 32   | 39   | 36,4 | 32   | 39   | 39    | 37,5 | 32,1     | 0,34  | 0,2  | 1,1936 |
| 64 | 16:57 | 148 | 1,95 | 1,07 | 60           | 148      | 0,9408   | 25       | 0,33     | 0,79   | 0,46  | 32   | 39   | 36,4 | 31,5 | 39   | 39    | 37,9 | 31,6     | 0,32  | 0,2  | 1,2    |
| 65 | 17:02 | 149 | 2,12 | 1    | 65           | 148      | 0,9407   | 30       | 0,83     | 1,31   | 0,48  | 31   | 38   | 38   | 30,6 | 38   | 31,7  | 36,8 | 30,6     | 0,39  | 0,2  | 1,35   |
| 66 | 17:07 | 149 | 2,24 | 1    | 65           | 148      | 0,9407   | 30       | 0,83     | 1,31   | 0,48  | 32   | 38   | 38   | 34,5 | 38   | 31,7  | 36,8 | 31,7     | 0     | 0    | 0      |
| 67 | 17:07 | 146 | 2,24 | 1    | 70           | 148      | 0,7372   | 15       | -2       | -3,5   | -1,5  | 34   | 38   | 38   | 34,2 | 38   | 38    | 38   | 34,3     | 0     | 0    | 0      |
| 68 | 17:12 | 141 | 2,05 | 1    | 75           | 148      | 0,9947   | 15       | -5,4     | -8,4   | -3    | 44   | 38   | 38   | 34,2 | 38   | 38    | 49,2 | 44,1     | 0     | 0    | 0      |
| 69 | 17:17 | 134 | 1,86 | 1    | 0            | 134      | 1        | 15       | -6,99    | -8,97  | -1,98 | 45   | 38   | 38   | 38   | 38   | 38    | 45,2 | 45,2     | 0     | 0    | 0      |
| 70 | 17:22 | 124 | 1,68 | 1    | 0            | 124      | 0,9998   | 15       | -9,81    | -12,33 | -2,52 | 48   | 38   | 38   | 38   | 38   | 38    | 47,5 | 47,5     | 0     | 0    | 0      |
| 71 | 17:27 | 112 | 1,51 | 1    | 0            | 112      | 0,9999   | 20       | -12,15   | -14,59 | -2,44 | 47   | 38   | 38   | 38   | 38   | 38    | 47,2 | 47,2     | 0     | 0    | 0      |
| 72 | 17:32 | 102 | 1,34 | 1    | 0            | 102      | 0,9986   | 15       | -10,76   | -10,72 | 0,04  | 38   | 38   | 38   | 38   | 38   | 38    | 37,8 | 37,8     | 0     | 0    | 0      |
| 73 | 17:37 | 93  | 1,18 | 1    | 0            | 93       | 0,9999   | 15       | -8,79    | -7,29  | 1,5   | 34   | 38   | 38   | 38   | 38   | 38    | 33,9 | 33,9     | 0     | 0    | 0      |
| 74 | 17:43 | 85  | 1,03 | 1    | 0            | 85       | 1        | 15       | -8,01    | -7,02  | 0,99  | 33   | 38   | 38   | 38   | 38   | 38    | 32,8 | 32,8     | 0     | 0    | 0      |
| 75 | 17:47 | 78  | 0,89 | 1    | 0            | 78       | 1        | 15       | -7,02    | -6,03  | 0,99  | 33   | 38   | 38   | 38   | 38   | 38    | 32,8 | 32,8     | 0     | 0    | 0      |
| 76 | 17:53 | 75  | 0,76 | 1    | 5            | 76,5     | 0,9991   | 30       | -4,6     | -3,13  | 1,47  | 34   | 38   | 38   | 38   | 38   | 34    | 34   | 0        | 0     | 0    |        |
| 77 | 17:58 | 74  | 0,63 | 1    | 10           | 75,7     | 0,9984   | 35       | -2,22    | -0,52  | 1,7   | 34   | 38   | 38   | 38   | 38   | 33,5  | 33,5 | 0        | 0     | 0    |        |
| 78 | 18:03 | 72  | 0,5  | 1    | 10           | 73,7     | 0,9985   | 40       | -0,71    | 0,95   | 1,66  | 32   | 36   | 36   | 36   | 36   | 36    | 31,8 | 31,8     | 0     | 0    | 0      |
| 79 | 18:07 | 71  | 0,37 | 1    | 15           | 73       | 0,9981   | 45       | 0,43     | 1,99   | 1,56  | 32   | 36   | 36   | 36   | 36   | 36    | 32,1 | 32,1     | 0     | 0    | 0      |
| 80 | 18:12 | 68  | 0,26 | 1    | 10           | 70,3     | 0,9903   | 45       | 0,64     | 1,94   | 1,3   | 33   | 36   | 36   | 36   | 36   | 36    | 32,9 | 32,9     | 0     | 0    | 0      |
| 81 | 18:18 | 67  | 0,15 | 1    | 5            | 67,5     | 0,9832   | 30       | -1,67    | -1,62  | 0,05  | 36   | 36   | 36   | 36   | 35,8 | 36    | 35,8 | 35,8     | 0     | 0    | 0      |
| 82 | 18:22 | 65  | 0,05 | 1    | 10           | 66,7     | 0,9886   | 35       | -1,72    | -1,69  | 0,03  | 35   | 36   | 36   | 36   | 35,1 | 36    | 35,9 | 35,1     | 0     | 0    | 0      |
| 83 | 18:27 | 63  | -0   | 1    | 15           | 65,8     | 0,9966   | 15       | -2,21    | -2,71  | -0,5  | 36   | 36   | 36   | 36   | 34,1 | 36    | 37,5 | 35,5     | 0     | 0    | 0      |
| 84 | 18:32 | 68  | -0,1 | 1    | 0            | 68       | 0,9075   | 45       | -0,23    | 0,08   | 0,31  | 37   | 36   | 36   | 36   | 36,5 | 36    | 35,9 | 36,5     | 0     | 0    | 0      |
| 85 | 18:37 | 80  | -0,2 | 1    | 0            | 80       | 1        | 15       | 12       | 19,01  | 7,01  | 23   | 36   | 36   | 36   | 36   | 36    | 23,1 | 23,1     | 2,03  | 1,1  | 4,76   |
| 86 | 18:38 | 80  | -0,2 | 1    | 0            | 80       | 1        | 15       | 12       | 19,01  | 7,01  | 18   | 36   | 36   | 36   | 36   | 36    | 17   | 18       | 5,11  | 1,1  | 6      |

(Around 18:30h is start of next meal)

## Resulting tuning

Autosense interference is not helpful and will be shut off

bgAccel\_ISF\_weight 0.16 is responsible for the early SMB sizes. It will be sharpened to 0.20, considering that some delta\_ISF contribution will be reduced also in this phase. .

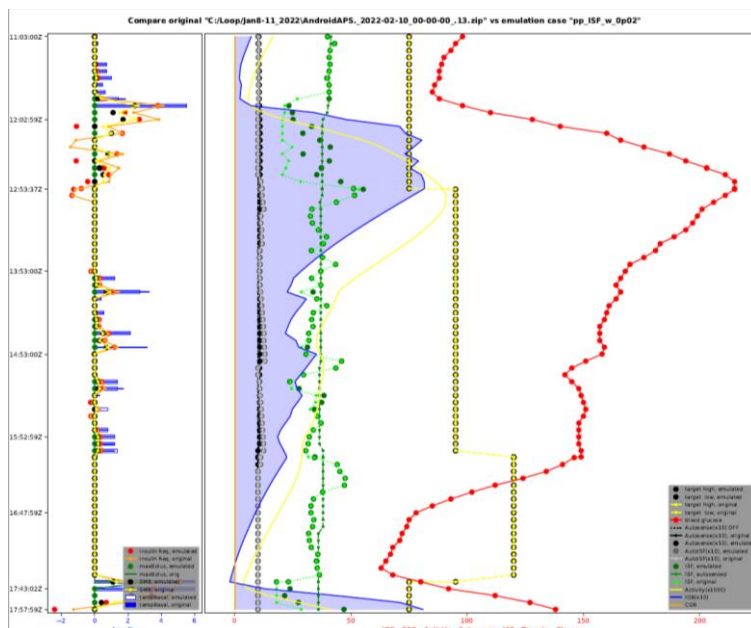
bgBrake\_weight will be slightly elevated 0.08 -> 0.11

max\_autoISF is elevated from 2 to 2.5 erhöht.. min\_autoISF\_ratio goes 0.5 to 0.4

delta\_ISF\_weight ( 0.8) is reduced to 0.6

pp-ISF\_weight showed over long stretches a too strong lowering of ISF. It gets strongly reduced from 0.1 -> 0.02.

This measure was cross-checked using the emulator, see next graph: ,



Investigating effect of reduced pp\_ISF\_weight (0.02, dark green points) vs. past setting (light green: ISF with 0.1 value) using the d.b. emulator:

In the mid and late stage of rising glucose, there would be an effect of lower insulin given.

Also after the max., there a a couple of instances where glucose jumps up briefly, and less insulin would be given with the reduced setting.