In our session "What I always wanted to know ..." we had the question

How would you choose the period for LOTEM?

Carsten Scholl continued thinking about it even after the colloquium and send an email with some additional thoughts. Here is his email:

Well, in the discussion I said that it is not necessary to wait until the signal is decayed into the noise level before switching again, which is totally true. Actually, this would be to some extent a circular argument, because the noise level depends on the number of stacks, and the number of stacks depends on the period.

So, one should check before with synthetic models, which time range is required to resolve a certain feature. Note, the time range to RESOLVE a feature, is not the same (and typically significantly larger) than the time range up to the point where deviations between the "target" and "no target" curves appear. I recommend doing 1D inversions with reasonable noise estimates for resolution studies… . Further, it is advisable to increase this time, because the true background resistivity might deviate from the synthetic und thus delay the features representing the target.

The time saved by using a higher period and thus collecting the required number of stacks faster can be used by measuring at more sites.

Often, in academic LOTEM campaigns, the target depth is not well defined but you'd like to get as deep as possible. Further, setting up LOTEM stations is tedious and the number of stations is limited anyways because of limited equipment. Often, the time spent on deploying and packing up the sensors exceeds the actual measurement time. So, in this case, there is not really the option to measure more sites on the same day (well, I always envision a roll-along scheme, where you start to measure at one station while building up the next site. When the final site is set up, the first site is redeployed, while the TX is still running…).

In this case, I recommend to take some generous period the first day. In the evening the data for the day should be processed to see what the latest usable time is (this should be done with either a switch-off E-field or a magnetic component). For the subsequent days, the period should be set to something slightly longer (say, a factor of 2) longer than this time.

Another aspect of this question: You should check, whether your time domain forward solver actually can handle higher switching times by taking into account previous transients. Otherwise, it might be better to stick to a more conservative period as well.