

The default method for finding PCA components in **temDM MSA** is the NIPALS algorithm that extracts components sequentially every time capturing a component with the highest variance. This allows to find sufficiently accurately 10-20 components within a reasonably short time. Usually, 10-20 components are enough to pick up all your meaningful data variations. However, sometimes you need a larger number of PCA components, for instance, to investigate how the noise variance behaves with increasing the component index.

The advanced version of **temDM MSA** includes the original in-house developed algorithm for the truncated SVD. If you are unsure how many components you need - start with NIPALS. You can extract first only few major components and then gradually increase the number of components until you get a clear idea about your data set. If you know in advance that you need many components - run SVD.

The **temDM MSA** program allows to extract PCA components incrementally, without overwriting the previously found components. This nice feature is readily applied to the combination of the NIPALS and SVD algorithms.

From the table below you get an idea about the time consumed for SVD. This was obtained by treating a 100x100x2000 spectrum-image in GMS3 using a i5-3470 processor.

Table 1 – Comparative performance of the NIPALS and SVD algorithms

NIPALS	25 components	120 sec
SVD	25 components	25 sec
SVD	50 components	56 sec
SVD	100 components	132 sec
SVD	200 components	329 sec
SVD	400 components	893 sec

