Assume our data is given by:

Then,

Normalized ACF:

In the limit of , the normalized ACF approaches .

Note, this definition of the ACF uses constant T for each lag times. This definition is more common in chemistry.

Consider another definition:

For the sine function, this gives:

So the normalized ACF is:

This definition is very similar to the one above. In the limit of sufficiently large, the two definitions are equivalent.