



Opinion

What's in a 'NYM'?

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The field of electron microscopy, by its diverse nature, abounds with acronyms: AEM, EF-TEM, ESEM, FE-SEM, HREM, HRTEM, HVEM, SEM, STEM, TEM, and VP-SEM, to name a few of the instruments. Add in the different forms of data that these instruments might collect, and it can be overwhelming: ADF, BF, BSE, CBED, CL, DF, EBIC, EBSD/BEKP/BKD/EBSP, ECCI, EDS/EDX, EELS, HAADF, NBD, SAD, and SE. For the brave reader, check out the acronym listing at the beginning of DB Williams and CB Carter's series on TEM [1].

How do we microscopists and microscope users (this difference may be a separate opinion item...) come up with these acronyms? Do we develop phrases that describe a phenomenon with 100% scientific accuracy? Do we think of wording that distinguishes a phenomenon or activity with 100% uniqueness? Do we come up with wording to captivate our intended audience, albeit perhaps with less than 100% scientific accuracy? There are accuracy, completeness, and ambiguity exceptions to many of the examples I've mentioned above, yet all of us know what these acronyms mean. For example, if we collect a convergent-beam electron diffraction (CBED) pattern, are we not in reality also performing nanobeam diffraction (NBD)? Example two: most electrons collected by electron backscatter diffraction (EBSD) detectors are actually forward-scattered, if one considers the strict definition imparted by the $> 90^\circ$ cumulative scattering angle argument [2]; does that mean it should be EFSD rather than EBSD? Does the name even matter much once we communicate the technique, know what is involved, and interpret the results?

Truth be told, there are no real rules, and all of those reasons are valid for naming a technique—preferred names come into use only when they stand the tests of time and scrutiny. As a self-described “microscope user” who incorporates electron microscopy into virtually every project I've worked on, I find myself on the fence between the purists' view of 100% scientifically accurate names and effectively getting the message out.

Now an interesting little story that shows there is at least a little interest in acronyms, or “NYMs,” and that there can in fact be some humor in it: Some colleagues and I are fortunate to be working on a new technique that needed a name a little over a year ago. The technique involves the use of an EBSD detector to collect diffraction patterns formed by electrons that have been Kikuchi-scattered and transmitted through a specimen in an SEM. We suggested “transmission electron forward scatter diffraction,” or t-EFSD. A journal reviewer who was complimentary about the work, but not “t-EFSD,” felt that the field is already saturated with technique acronyms, so why come up with another cumbersome one? I understand

this, sort of... So we decided to take the approach of trying to reach those we thought could quickly benefit from the new method, by including an existing technique in the name, and this resulted in “transmission electron backscatter diffraction,” or t-EBSD, which was accepted by the journal [3]; a summary of the technique also recently appeared in this magazine [4]. This name contains a contradiction if one considers that probably very few electrons are able to be both transmitted and backscattered. But when people see how it works, it has meaning to them. A colleague halfway around the world seemed to like the technique and wrote a nice paper on it [5]. However, in the course of review, “t-EBSD” didn't quite cut it. So he came up with another name that is more scientifically accurate, albeit requiring the use of eight words for nearly complete accuracy: “transmission Kikuchi diffraction in the scanning electron microscope,” or TKD in the SEM. Ok, I get it now, I think. Then, another group published another nice paper [6], this time in the same journal in which our initial work appeared, that resulted in the use of “t-EFSD”—our originally-suggested, but rejected name! Go figure... So now, we have multiple papers describing measurements by the same physical phenomenon, but with three different names associated with it (all having their virtues, of course!) and with varying amounts of reviewer influence. History shows that this is all ok—it will get sorted out; after all, it did in the case of backscattered electron Kikuchi patterns, er... backscatter Kikuchi diffraction, er... electron backscattering patterns, er... electron backscatter diffraction!

Regardless of the name, I'm personally glad the new technique is gaining traction. I conclude that it is fortunate indeed that techniques do not seem to care what they are called and that most of us are willing and able to use them regardless of whether we like the name. But if you do find yourself in the position of “NYMing” a new technique, don't be surprised at what might ensue.

References

- [1] DB Williams and CB Carter, *Transmission Electron Microscopy*, vol. I, Plenum, New York, 1996, p. xiii.
- [2] JI Goldstein et al., *Scanning Electron Microscopy and X-Ray Microanalysis*, 2nd ed., Plenum, New York, 1992, p. 91.
- [3] RR Keller and RH Geiss, *J Microsc* 245 (2012) 245–51.
- [4] RH Geiss, KP Rice, and RR Keller, *Microscopy Today* 21(3) (2013) 16–20.
- [5] PW Trimby et al., *Ultramicroscopy* 120 (2012) 16–24.
- [6] N Brodusch, H Demers, and R Gauvin, *J Microsc* 250(1) (2013) 1–14.

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