Thoughts on the acronyms "GMPE", "GMPM", and "GMM"

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I coined the acronym "GMPE" in Appendix A.1 of Boore and Atkinson (2007). Here is the main part of that appendix:

> **A.1 "GMPES" VS. "ATTENUATION RELATIONS"**
> I propose that we do away with the term "attenuation relations" to describe the equations predicting ground motion. I realize that this term is deeply ingrained in our profession, but like jargon in other fields, does not promote a clear understanding of the subject. The problem in earthquake engineering is that the equations do more than predict attenuation (the change of amplitude with distance); they also predict absolute levels of ground motion and therefore also the change in amplitude as a function of earthquake magnitude at a given distance (as controlled largely by source scaling). In addition, ground motions along a given profile might actually increase with distance (think "Moho bounce"), and in the future more sophisticated path- and/or regionally dependent predictions of ground motion might include an increase of motion at some distance ranges. Finally, there is the potential for confusion because some people really do mean *Q* and geometrical spreading when using the term "attenuation relations." What do I suggest as a replacement? I doubt that any term is without potential misunderstanding or would receive universal approval, but here are several possibilities: "ground-motion prediction equations," although some people do not like the word "prediction"; "ground-motion estimation equations"; or "ground-motion models" (a term preferred by Ken Campbell, recognizing that some models are in the form of look-up tables rather than equations). All of the phrases can be preceded by one of these qualifiers, as appropriate: empirical, hybrid, or theoretical. In this report we use "GMPEs."

"GMPEs" is now well established in the literature, and it seems that I was successful in my effort to reduce, if not eradicate, the use of "attenuation relations". But I am now having second thoughts about using "GMPEs" to describe the equations (they are usually a set, not a single equation) for predicting ground-motion intensity measures (GMIMs). As stated in Appendix A.1 above, "GMPEs" is clearly not appropriate when the GMIMs are in the form of tables rather than equations (as they are, for example, in a number of the NGA-East "seed" models [Goulet et al., 2015]; see also Boore, 2020). But even if the model is in the form of equations, it can be potentially confusing to refer to the set of equations for a given developer team as GMPEs (e.g., "the Boore

et al. (2014) GMPEs"), when it is also natural to refer to the equations from more than one developer as "GMPEs", as for example "the NGA-West2 GMPEs". And because the model for a given developer team is almost always a set of equations, I think it inappropriate to refer to the set of equations as "GMPE" (singular). I would like to replace the reference to the set of equations for a given developer team as a ground-motion prediction model (GMPM), which is made up of a set of ground-motion prediction equations or table of GMIMs. But alas, the acronym "GMM" (for ground-motion model) seems to be gaining favor in the literature, so my preference for "GMPM" is likely to be ignored. I have not surrendered completely, however: the title of a recently submitted paper is "A Ground-Motion Prediction Model for Shallow Crustal Earthquakes in Greece", and the first sentence of the Abstract is "Using a recently completed database of uniformly processed strong-motion data recorded in Greece, we derive a ground-motion prediction model (GMPM) for horizontal-component peak ground velocity, peak ground acceleration, and 5%-damped pseudo-acceleration response spectra at 105 periods ranging from 0.01 s to 10 s."

References

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