about the quality of a comparison. This may be numerical or converted to a natural language descriptor.

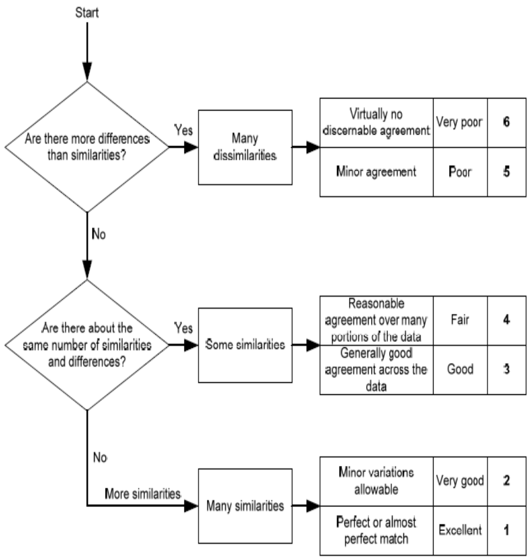

Fig. 1

These figures of merit can be further represented in three different ways in order to quantify the quality of the comparison performed:

- GDMi, ADMi and FDMi: These are point-by-point comparisons of the amplitude differences, the feature differences and the global differences. This allows a user to analyze the resulting data in some detail, probably with the aim of understanding the origin of the contributors to poor comparisons.
- GDMc, ADMc and FDMc: These give probability density functions which show the proportion of the point-by-point analyses of each of the components that falls into the six natural language descriptor categories. This provides a measure of confidence in the single figure comparisons.
- GDMtot , ADMtot , FDMtot , GDMcon f , ADMcon f , FDMcon f , GDMpw, ADMpw, FDMpw. These are more synthetic figures of merits of the comparison and stem from an elaboration of the variables described in the previous points. They are described later. Based on these figures of merit, the comparison of two data sets can be ranked.

V. Conclusion

The use of FSV has largely remained limited to electromagnetics when it houses potential of great applications in many other fields, fluid mechanics for example. The vast solutions offered by scientists and students worldwide to shock problems can, for instance be objectively validated using the FSV technique. After all this, FSV is still a technique in development and quantified validation for CEM is still a very young subject. It provides information that is essential for the formal validation of numerical modeling data in a way that appears to provide a good approximation to the group response of visual assessment. However, there are a number of pressing challenges to be overcome in order to extend the reach of FSV. These include a better mathematical representation and implementation of FSV, developing a better understanding of how humans approach the comparison of multiple dimension data, the effects of zero crossing data and an appreciation of the cumulative effects of numerical noise on the comparison.

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