Changes to manuscript:

- I added 2 sections (before the discussion)
  1) An example to illustrate the actual implementation using a single curved element. This example also shows that the third mapping approach requires a bit more work. For brevity, the example is not worked out completely in all its details, but provides enough information for those interested in implantation details.
  2) An application that requires the kind of mappings discussed in this manuscript.

  Both sections, but particularly the last section are added because both reviewers requested a simulation example. Here I provide an example on a curved surface that uses quadratic triangular elements. This is the same kind of element that I discuss in the example. Since it is a steady-state problem, it only involves the conductance matrix.

  I tried to provide an application that could be useful (potentially) for a practical problem. The application here could be useful to simulate water inrush during tunnel construction when a fracture is crossed. I also tried to provide an example that corresponds to the premises in the theoretical part. Hence, I used curved elements in the application.

- As proposed by Reviewer 2, I moved some details about the Penrose-Moore matrix to an Appendix.
- I corrected the symbol used for the Kronecker delta (equation 3)
- I added a few equations in anticipation of the example (17 and 43). In terms of how to implement the mappings, I think that these two additions are quite useful (in a practical sense).
- In section 6 (Gradient mapping using directional cosines), I made a few corrections. Those affect the last equations.
- An additional reference has been added which is used in the example.

I would like to thank the reviewers for their comments. I agree that the application example is a useful addition to the manuscript. In addition, I decided to provide an example showing how the mappings are implemented by just looking at a single element.

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