Implementing graphic outputs for the Material Properties Open Database (MPOD)

L. Fuentes[1,*], D. Chateigner[2], G. Pepponi[3], S. Gražulis[4], G. Ramírez[5], I.Templeton[1], J. Hernández[1], M. López[1], A. Márquez[5], D. Sánchez[6]

[1]Centro de Investigación en Materiales Avanzados, S.C. Chihuahua, México

[2]Normandie Université, CRISMAT-ENSICAEN Caen, France

[3]MiNALab, CMM-irst, Fondazione Bruno Kessler, Trento, Italy

[4]Department of Protein – DNA Interactions, Vilnius University, Vilnius, Lithuania

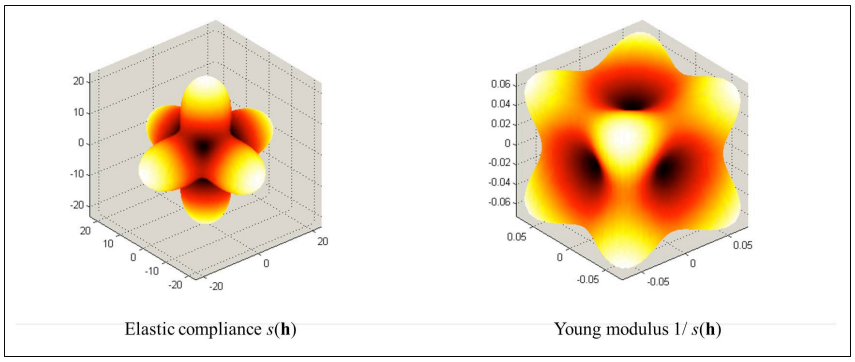
[5]Facultad de Ingeniería, Universidad Autónoma de Chihuahua, Chihuahua, México

[6]Bituos Tools. Chihuahua, México.

[*] Corresponding Author e-mail: luis.fuentes@cimav.edu.mx

Keywords: Crystal tensor properties, Geometric representation

Abstract. The tensor nature of single- and polycrystalline materials' physical properties highlights both the diversity of possible technological applications and the difficulties of assimilation for those new to the subject. The Material Properties Open Database (MPOD [1]) is a useful tool that provides access to a wide spectrum of properties tensors for an extensive selection of materials. In the present contribution an extension of the MPOD system is reported. The introduced innovation is the output, in the form of a graphical representation, of registered second, third and fourth rank tensors. The objective is to provide the crystallographic community a friendly means to help the intuitive understanding of crystalline anisotropy. The given graphical output is the so-called *longitudinal surface representation* [2]. The accompanying figure shows an example of the MPOD graphical output. Shown surfaces represent the compliance tensor and its inverse (Stiffness moduli) longitudinal surfaces for a silver single-crystal. MPOD's new version may be accessed by the original website http://www.materialproperties.org/ and also by its Mexican mirror http://mpod.cimav.edu.mx. The MPOD websites continue their development. The international MPOD group systematically adds new published data. Modeling and representing textured polycrystals' properties is on target [3]



Acknowledgements. Support from Project CONACYT-CNPQ 174391 is recognized.

References

1. Giancarlo Pepponi, Saulius Gražulis, Daniel Chateigner. MPOD: A Material Property Open Database linked to structural information. Nuclear Instruments and Methods in Physics Research **B 284** 10–14 (2012). .
2. Robert E. Newnham. Properties of Materials. Oxford Univ. Press. NY (2012).
3. Luis E. Fuentes-Cobas, Alejandro Muñoz-Romero, María E. Montero-Cabrera, Luis Fuentes-Montero, María E. Fuentes-Montero. Predicting the Coupling Properties of Axially-Textured Materials. Materials **6** (11), 4967-4984 (2013).