



## Einladung zum Oberseminar Mathematik in den Naturwissenschaften

Julius-Maximilians-Universität Würzburg  
Lehrstuhl für Mathematik in den Naturwissenschaften

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### Symmetric Lamination Hulls in Three-Well Problems

We extend a result of Capella et al. from the  $2 \times 2$  to the  $3 \times 3$  symmetric setting, showing that if a three-well set  $K \subset \mathcal{S}^{3 \times 3}$  of linear strains contains at least one pair of rank-one compatible wells, then the symmetric lamination, polyconvex, and quasiconvex hulls of  $K$  all coincide.

Our main focus, however, is the detailed analysis of the symmetric lamination convex hull  $K^{slc}$  in the case where exactly two pairs of wells are compatible. In this setting, we provide a precise and constructive characterization of  $K^{slc}$ , leading to an explicit inner bound for the symmetric quasiconvex hull  $K^{sqc}$ .

The analysis relies on two scalar quantities, geometric compatibility indices of the form

$$\zeta_{ijk} = \text{cof}(\varepsilon_i - \varepsilon_j) : (\varepsilon_i - \varepsilon_k), \quad \zeta_{kji} = \text{cof}(\varepsilon_k - \varepsilon_j) : (\varepsilon_k - \varepsilon_i)$$

which capture the geometric interaction among the three strains and govern the structure of  $K^{slc}$ .

Finally, in the diagonal case, we show that regular incompatibility still leads to the coincidence of all three hulls, while in the singular case, the symmetric polyconvex hull strictly contains the lamination hull.

This is joint work with Hamza Youcef Ettoumi.

Ort: Mathematik Ost, 40.01.003/Zoom

Zeit: Mittwoch, 27.11.2025 um 12:00 Uhr

You are cordially invited to this lecture. The speaker will be there in person. A hybrid meeting is possible. Please request the link from [anja.schloerkemper@uni-wuerzburg.de](mailto:anja.schloerkemper@uni-wuerzburg.de).

gez. Anja Schlömerkemper