Indicar: es semianalitico, lambda puede negativos Tambien para el tstress, mejor el generalized plane strain, esquinas no redondeadas, pero al ser solucion local valen. Q es la matriz E

ON-LINE TOOL FOR ANALYSIS OF SINGULAR STRESSES AND DISPLACEMENTS IN ANISOTROPIC MULTI-MATERIAL CORNERS

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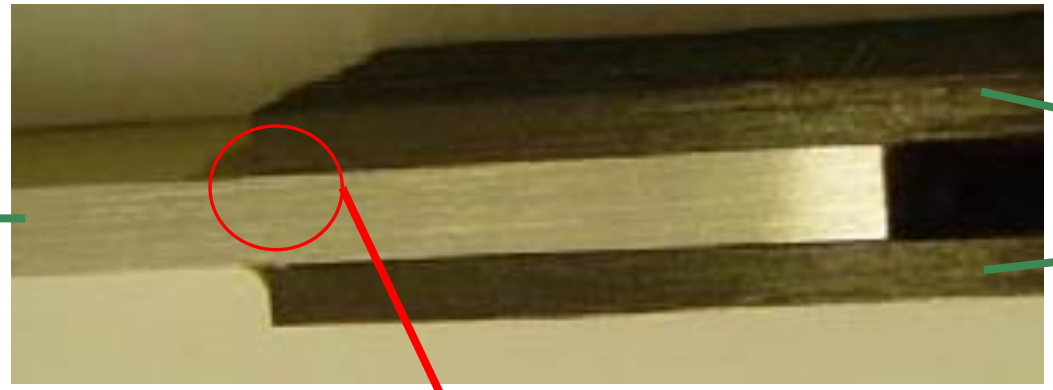
5- Conclusions

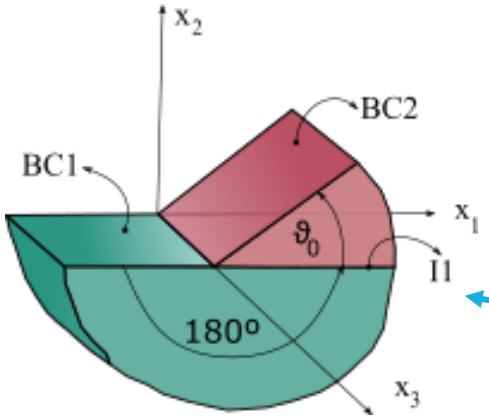
MOTIVATION

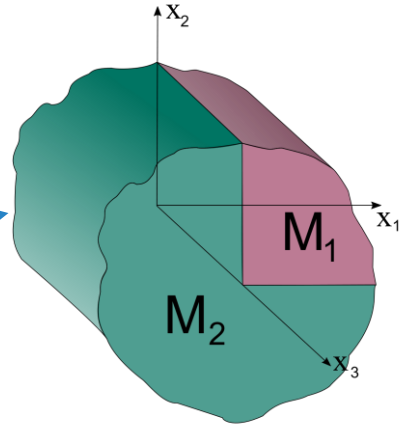
What do we have here?

Aluminum plate



Carbon fibre composite





MOTIVATION

What do we have here?

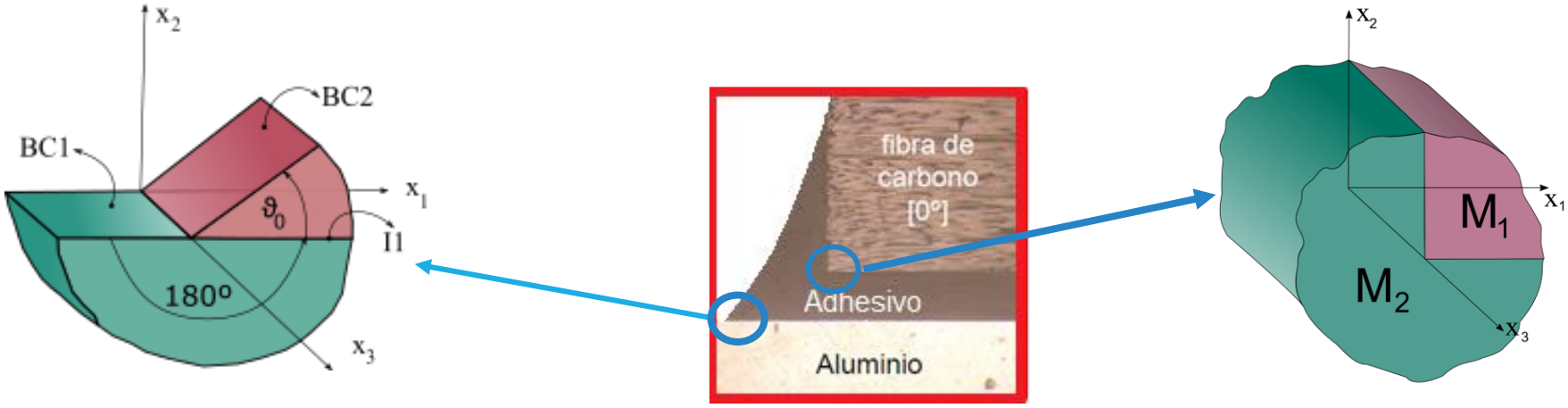
Material discontinuities

Boundary or interface condition discontinuities

Geometry discontinuities

The theory of linear elasticity predict unbounded stresses where failure can be initiated

Local analysis of the stress field is recommended in these SINGULAR POINTS



MOTIVATION

State of the art

Particular expressions for the stress fields:

-Sinclair (2004): Solution for uni-material and multi-material isotropic corners. Different boundary conditions
-Chen et al.(2012), Poonsawat et al. (2010)… particular geometries of anisotropic materials corners

General CODES	Single and Multi-material	Isotropic and anisotropic	General boundary conditions	General interface conditions	Dimension
Papadakis Babuska (1995)	✓	✓	✗ Neumann or Dirichlet	✗ Perfectly bonded	2D
Yosibash (1997)	✓	✓	✗ Neumann or Dirichlet	✗ Perfectly bonded	3D
Costabel, Dauge Lafranche (2001)	✓	✓	✗ Neumann or Dirichlet	✗ Perfectly bonded	3D
Lee, Barber (2006)	✓	✗ Only Isotropic	✓ Traction-free, clamped Frictionless Frictional	✓ Bonded, Frictionless Frictional contact	2D

OBJECTIVE

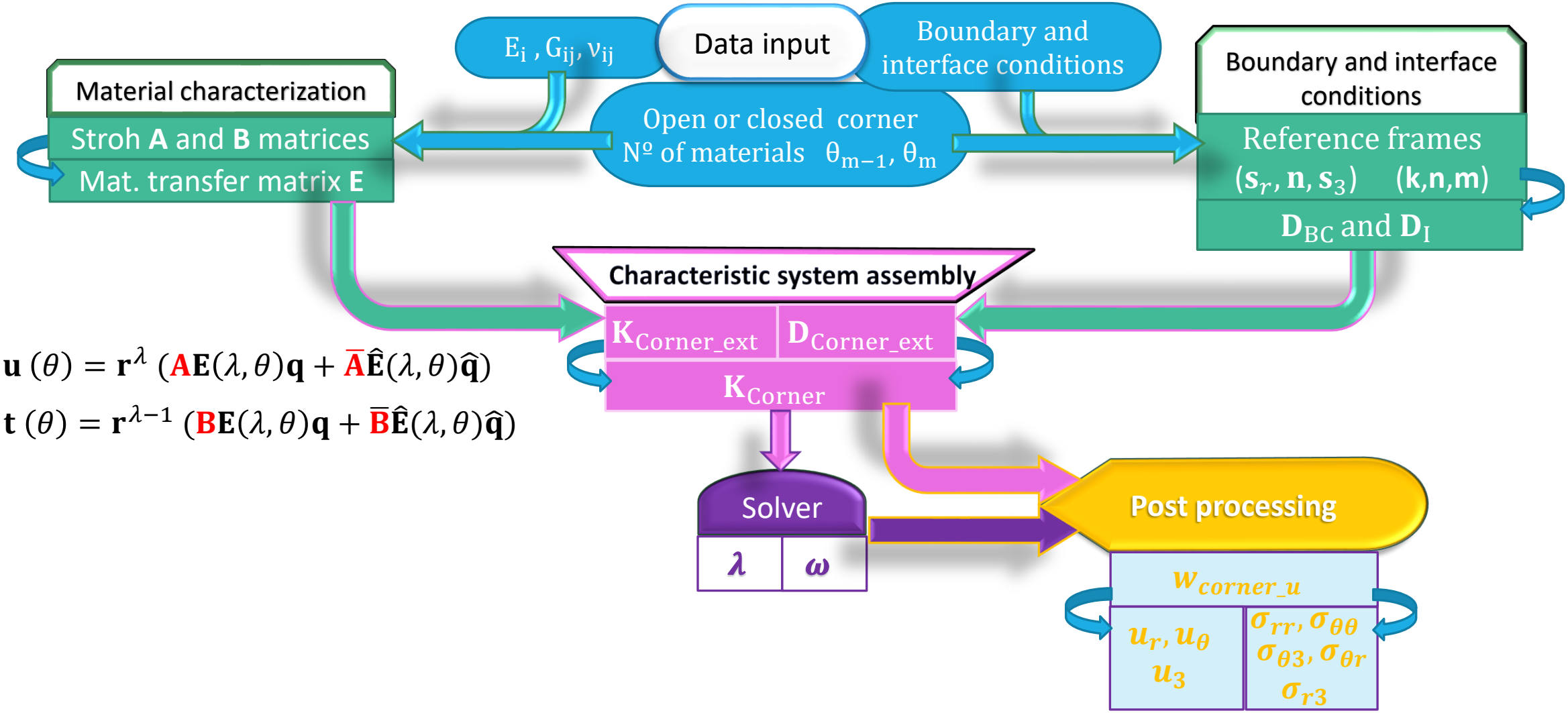
General CODES	Single and Multi-material	Isotropic and anisotropic	General boundary conditions	General interface conditions	Dimension
Herrera, Mantic, Barroso (2022, 2023)	✓	✓	✓ Traction-free, clamped, frictionless frictional, symmetry, antisymmetry…	✓ Bonded, frictionless and frictional contact	2.5D

Objective of this work:

Present the on-line tool for analysis of singular points

Herrera, Mantic and Barroso, 2022 TAFMEC
Herrera, Mantic and Barroso, 2022 TAFMEC (under review)

THE CODE

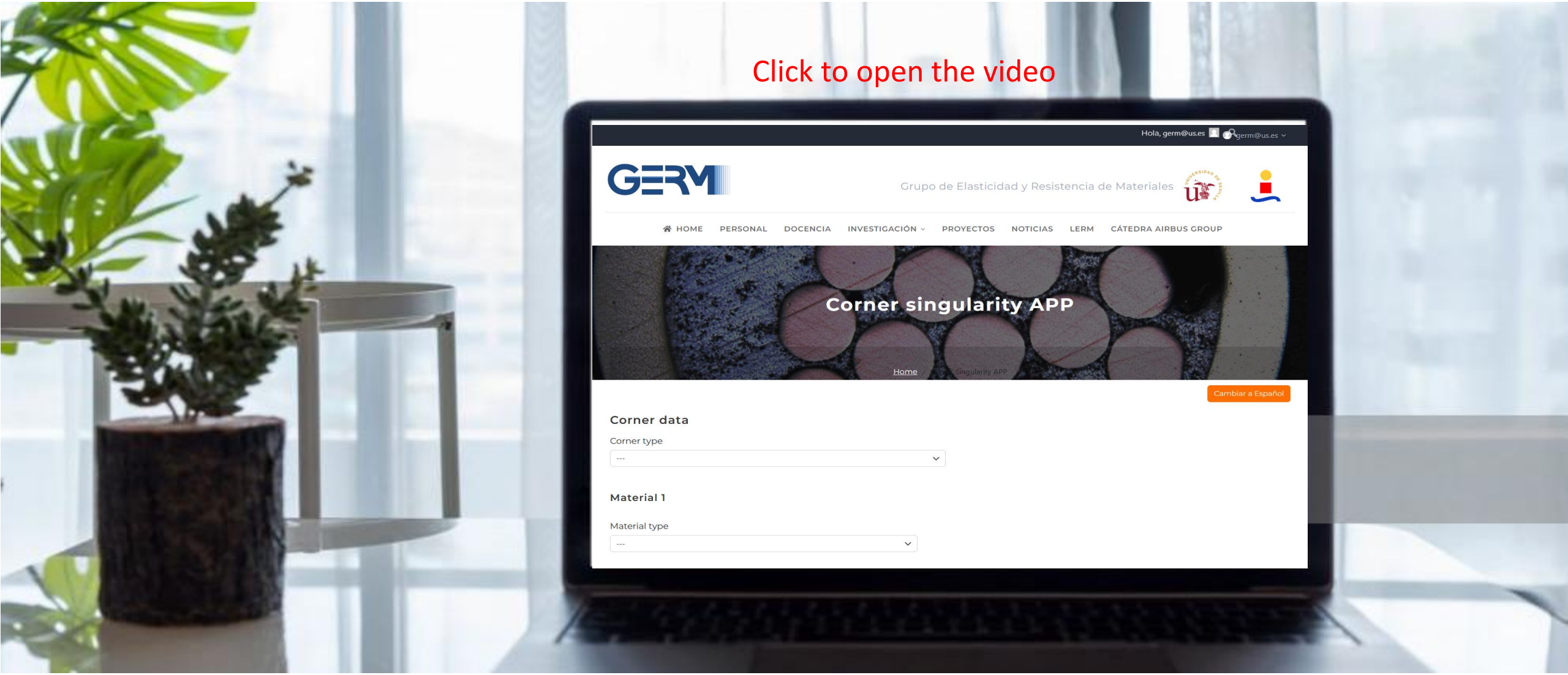


$$\mathbf{u}(\theta) = \mathbf{r}^{\lambda}\left(\mathbf{A}\mathbf{E}(\lambda,\theta)\mathbf{q} + \bar{\mathbf{A}}\hat{\mathbf{E}}(\lambda,\theta)\hat{\mathbf{q}}\right)$$

$$\mathbf{t}(\theta) = \mathbf{r}^{\lambda-1}\left(\mathbf{B}\mathbf{E}(\lambda,\theta)\mathbf{q} + \bar{\mathbf{B}}\hat{\mathbf{E}}(\lambda,\theta)\hat{\mathbf{q}}\right)$$

CORNER SINGULARITY-APP

Click to open the video



CORNER SINGULARITY-APP

SINGULARITY RESULT: mensaje - Correo

Responder ··· Probar el nuevo Outlook

SINGULARITY RESULT

germsingularity@gmail.com <germsingularity@gmail.com>
21:45

Para: MARIA ANGELES HERRERA GARRIDO

output.pdf
110,7 KB

Hello, here are the roots obtained for the requested corner:

0j
(0.5702049625852215+6.258393466318146e-16j)

Please, do not reply to this email.

CONCLUSIONS

-A general code for singular stress and displacement analysis for isotropic or anisotropic multi-material corners with different boundary and interface condition has been developed

-The code is available in the following link:

https://www.germus.es/corner-singularity-app/

Enjoy it!

Thank you!

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https://www.germus.es/corner-singularity-app/

Enjoy it!