

**NUEVAS PERSPECTIVAS EN HOMOGENEIZACIÓN Y PERTURBACIONES ESPECTRALES. ASPECTOS MATEMÁTICOS (PGC2018-098178-B-I00)  
MCIN/ AEI /10.13039/501100011033/ FEDER "Una manera de hacer Europa"**

Responsable: María Eugenia Pérez Martínez

Equipo de investigación: María Eugenia Pérez Martínez, Delfina Gómez Gandarillas

Fecha: 01/01/2019-31/08/2022

<b>E. Difusión de los resultados del proyecto</b>	
<i>Relacione únicamente los resultados derivados de este proyecto.</i>	
<b>E1. Publicaciones en revistas con "peer review" directamente relacionadas con los resultados del proyecto.</b>	
<i>Indique autores*, título, referencia de la publicación, año ....</i>	
1.	D. Gómez, M. Lobo, <b>M.-E. Pérez-Martínez</b> . Asymptotics for models of non-stationary diffusion in domains with a surface distribution of obstacles. <i>Mathematical Methods in Applied Sciences, Letter</i> , 42, 403-413, 2019 ( <b>Q1</b> SJR) <a href="http://doi.org/10.1002/mma.5323">http://doi.org/10.1002/mma.5323</a>
2.	R. Orive-Illera, S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . Asymptotic structure of the spectrum in a Dirichlet-strip with double periodic perforations. <i>Networks and Heterogeneous Media</i> . Vol. 14, No. 4, 733-757, 2019 ( <b>Q1</b> SJR) <a href="http://doi.org/10.3934/nhm.2019029">http://doi.org/10.3934/nhm.2019029</a>
3.	A. Gaudiello, <b>D. Gómez</b> , <b>M.-E. Pérez-Martínez</b> . Asymptotic analysis of the high frequencies for the Laplace operator in a thin T-like shaped structure. <i>Journal de Mathématiques Pures et Appliquées</i> , Vol 134, 299-327, 2020 ( <b>Q1</b> SJR & JCR) <a href="http://doi.org/10.1016/j.matpur.2019.06.005">http://doi.org/10.1016/j.matpur.2019.06.005</a>
4.	<b>D. Gómez</b> , S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . Asymptotics for spectral problems with rapidly alternating boundary conditions on a strainer Winkler foundation. <i>J. Elasticity</i> . Vol. 142, p. 89-120, 2020 ( <b>Q1</b> SJR) <a href="http://doi.org/10.1007/s10659-020-09791-8">http://doi.org/10.1007/s10659-020-09791-8</a>
5.	<b>D. Gómez</b> , S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . Localization effects for Dirichlet problems in domains surrounded by thin stiff and heavy bands. <i>J. Differential Equations</i> . Vol. 270 p. 1160-1195, 2021 ( <b>Q1</b> SJR & JCR) <a href="http://doi.org/10.1016/j.jde.2020.09.011">http://doi.org/10.1016/j.jde.2020.09.011</a>
6.	<b>D. Gómez</b> , S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . Pointwise fixation along the edge of a Kirchhoff plate. In: <i>Mathematical problems in the theory of wave propagation</i> . Part 50, Zap. Nauchn. Sem. POMI, V. 493, POMI, St. Petersburg, p. 107–137, 2020. (Dedicated to Vasilii Mikhailovich Babich in occasion of 90-years jubilee; la versión en inglés aparecerá en <i>Journal of Mathematical Sciences</i> ) ( <b>Q3</b> SJR)
7.	<b>D. Gómez</b> , R. Orive-Illera, S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . Remark on Justification of Asymptotics of Spectra of Cylindrical Waveguides with Periodic Singular Perturbations of Boundary and Coefficients. <i>Journal of Mathematical Sciences</i> , Vol. 257, No. 5, 597- 623 (versión en ruso en: <i>Problemy Matematicheskogo Analiza</i> , Vol. 111, 43-65, 2021). ( <b>Q3</b> SJR) <a href="http://doi.org/10.1007/s10958-021-05506-z">http://doi.org/10.1007/s10958-021-05506-z</a>
8.	<b>D. Gómez</b> , R. Orive-Illera, S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . Spectral gaps in a double-periodic perforated Neumann waveguide. <i>Asymptotic Analysis</i> , Vol. 131, p. 385-441, 2023 ( <b>Q2</b> SJR) <a href="http://doi.org/10.3233/ASY-221776">http://doi.org/10.3233/ASY-221776</a>
9.	<b>D. Gómez</b> , <b>M.-E. Pérez-Martínez</b> . Boundary homogenization with large reaction terms on a strainer-type wall. <i>Zeitschrift für angewandte Mathematik und Physik (ZAMP)</i> 73:234, 2022, 28p. ( <b>Q1</b> SJR & JCR) <a href="http://doi.org/10.1007/s00033-022-01869-8">http://doi.org/10.1007/s00033-022-01869-8</a>
10	<b>D. Gómez</b> , R. Orive-Illera, S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . Asymptotic stability of the spectrum of a parametric family of homogenization problems associated with a perforated waveguide. <i>Mathematische Nachrichten</i> . Aceptado 2023, 28 p. ( <b>Q1</b> SJR & JCR) <a href="http://doi.org/10.1002/mana.202100589">http://doi.org/10.1002/mana.202100589</a>
11.	A. Gaudiello, <b>D. Gómez</b> , <b>M.-E. Pérez-Martínez</b> . A spectral problem for the Laplacian in joined thin films, <i>Calculus of Variations and Partial Differential Equations</i> . Aceptado 2023, 34 p. ( <b>Q1</b> SJR & JCR)
<b>E3. Publicaciones en libros/capítulos de libros</b>	
<i>Indique autores*, título, referencia de la publicación, año...</i>	
1.	S. A. Nazarov, R. Orive-Illera, <b>M.-E. Pérez-Martínez</b> . On the Polarization Matrix for a Perforated Strip. In: <i>Analytic Treatment and Numerical Approximations</i> . Birkhäuser, Springer, 2019, pp. 167-282. <a href="https://doi.org/10.1007/978-3-030-16077-7_21">https://doi.org/10.1007/978-3-030-16077-7_21</a>

2.	<b>D. Gómez</b> , S. Navazo-Esteban, <b>M.-E. Pérez-Martínez</b> . A Stiff Problem: Stationary Waves and Approximations. In: Analytic Treatment and Numerical Approximations. Birkhäuser, Springer, 2019, pp. 133-148. <a href="https://doi.org/10.1007/978-3-030-16077-7_11">https://doi.org/10.1007/978-3-030-16077-7_11</a>
3.	<b>D. Gómez</b> , S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . A Dirichlet Spectral Problem in Domains Surrounded by Thin Stiff and Heavy Bands. In: Computational and Analytic Methods in Science and Engineering. 2020, Birkhäuser, Springer, pp.101-126. <a href="https://doi.org/10.1007/978-3-030-48186-5_6">https://doi.org/10.1007/978-3-030-48186-5_6</a>
4.	<b>D. Gómez</b> , S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . Spectral homogenization problems in linear elasticity with large reaction terms concentrated in small regions of the boundary. In: Computational and Analytic Methods in Science and Engineering. 2020, Birkhäuser, Springer, pp 121-143. <a href="https://doi.org/10.1007/978-3-030-48186-5_7">https://doi.org/10.1007/978-3-030-48186-5_7</a>
5.	<b>M.-E. Pérez-Martínez</b> . Homogenization for alternating boundary conditions with large reaction terms concentrated in small regions. In: ICIAM2019 SEMA SIMAI Springer Series, pp. 37-57, 2021 <a href="https://doi.org/10.1007/978-3-030-62030-1_3">https://doi.org/10.1007/978-3-030-62030-1_3</a>
6.	<b>D. Gómez</b> , R. Orive-Illera, S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . Asymptotics for the spectrum of a Floquet-parametric family of homogenization problems associated with a Dirichlet waveguide. In: Integral Methods in Science and Engineering - Applications in Theoretical and Practical Research. Springer-Birkhäuser, pp. 95-111, 2022. <a href="https://doi.org/10.1007/978-3-031-07171-3_7">https://doi.org/10.1007/978-3-031-07171-3_7</a>
7.	<b>D. Gómez</b> , R. Orive-Illera, S.A. Nazarov, <b>M.-E. Pérez-Martínez</b> . A revisit to a double-periodic perforated Neumann waveguide: opening spectral gaps. Springer-Birkhäuser, sometido 2022, 14p.
8.	<b>D. Gómez</b> , <b>M.-E. Pérez-Martínez</b> . Spectral homogenization problems in linear elasticity: the averaged Robin reaction matrix. Springer-Birkhäuser, sometido, 2022, 12 p.
<b>E6. Asistencia a congresos, conferencias o workshops relacionados con el proyecto</b>	
1.-	<b>Nombre del workshop:</b> Homogenization, Spectral problems and other topics in PDE's, Workshop, Madrid (ICMAT) <b>Tipo de comunicación:</b> conferencia invitada <b>Título:</b> Asymptotics for spectral problems in domains with a stiff and heavy thin band. <b>Autores*:</b> <b>D. Gómez</b> <b>Año:</b> 2019
2.-	<b>Nombre del workshop:</b> International Conference on Elliptic and Parabolic Problems. Minisimposio "Spectral analysis and homogenization of PDEs". Gaeta, Italia <b>Tipo de comunicación:</b> conferencia invitada <b>Título:</b> Local effects for some spectral stiff problems. <b>Autores*:</b> <b>D. Gómez</b> <b>Año:</b> 2019
3.-	<b>Nombre del workshop:</b> 19 <sup>th</sup> International Conference on Computational & Mathematical Methods in Science & Engineering. Minisimposio: "Integral Methods in Science and Engineering". Costa Ballena, Cádiz. <b>Tipo de comunicación:</b> conferencia invitada <b>Título:</b> Local effects for some spectral problems in domains surrounded by thin stiff and heavy bands. <b>Autores*:</b> <b>D. Gómez</b> <b>Año:</b> 2019
4.-	<b>Nombre del workshop:</b> 19 <sup>th</sup> International Conference on Computational & Mathematical Methods in Science & Engineering. Minisimposio: "Integral Methods in Science and Engineering". Cádiz. <b>Tipo de comunicación:</b> conferencia invitada <b>Título:</b> Homogenization of spectral problems in linear elasticity with rapidly alternating boundary conditions. <b>Autores*:</b> <b>M.-E. Pérez-Martínez (IP)</b> <b>Año:</b> 2019
5.-	<b>Nombre del workshop:</b> 9 <sup>th</sup> International Congress on Industrial and Applied Mathematics boundary (ICIAM 2019). Minisimposium "Emerging problems in the Homogenization of PDE". Valencia. <b>Tipo de comunicación:</b> conferencia invitada <b>Título:</b> Asymptotics for spectral problems with strongly alternating boundary conditions <b>Autores*:</b> <b>M.-E. Pérez-Martínez (IP)</b> <b>Año:</b> 2019

<p><b>6.-</b>  <b>Nombre de conferencia:</b> Séminar de l'Université Jean Monnet, Institut Camille Jordan et SFR MODMAD, Saint Etienne, Francia  <b>Tipo de comunicación:</b> conferencia invitada  <b>Título:</b> Spectral boundary homogenization in linear elasticity: the role of the local problems.  <b>Autores*:</b> <i>M.-E. Pérez-Martínez (IP)</i>  <b>Año:</b> 2020</p>
<p><b>7.-</b>  <b>Nombre de conferencia:</b> Seminar "Asymptotics, Operators, and Functional". Online, U. of Bath, UK  <b>Tipo de comunicación:</b> conferencia invitada  <b>Título:</b> Homogenization for alternating boundary conditions: the spectral problems &amp; the stationary local problems. <b>Part I:</b> asymptotic expansions. <b>Part II:</b> the convergence.  <b>Autores*:</b> <i>M.-E. Pérez-Martínez (IP)</i>  <b>Año:</b> 2021</p>
<p><b>8.-</b>  <b>Nombre del workshop (simposio):</b> Symposium on the Theory and Applications of Integral Methods in Scientific Research. Online. Organizadores: U. Rio Grande (Brasil) &amp; U. Tulsa (USA) &amp; U. Brighton (UK) &amp; Euler Institute in St. Petersburg (Russia).  <b>Título:</b> Convergence for a boundary homogenization problem with high contrasts: the role of the local problems  <b>Tipo de comunicación:</b> conferencia invitada  <b>Autores*:</b> <i>M.-E. Pérez-Martínez (IP)</i>  <b>Año:</b> 2021</p>
<p><b>9.-</b>  <b>Nombre del congreso:</b> 1st EUNICE-Symposium on Pure &amp; Applied Mathematics. Online. Organizadores Brandenburg U. Technology, U. Cantabria, U. Catania, U. Mons, Polytechnic U. of Hauts-de-France  <b>Tipo de comunicación:</b> comunicación oral  <b>Título:</b> A spectral homogenization problem with high contrasts on the boundary condition.  <b>Autores*:</b> <i>M.-E. Pérez-Martínez (IP)</i>  <b>Año:</b> 2021</p>
<p><b>10.-</b>  <b>Nombre del workshop:</b> II Jornada Cantábrica de EDPs, Castro Urdiales (Spain)  <b>Tipo de comunicación:</b> conferencia invitada  <b>Título:</b> Localization phenomena for some spectral problems.  <b>Autores*:</b> <i>D. Gómez</i>  <b>Año:</b> 2022</p>
<p><b>11.-</b>  <b>Nombre de conferencia:</b> Online "Analysis and PDE seminar": Organized by UAM &amp; UC &amp; UC3M &amp; ICMAT &amp; IMUS  <b>Título:</b> Spectral boundary homogenization problems with high contrasts.  <b>Tipo de comunicación:</b> conferencia invitada  <b>Autores*:</b> <i>M.-E. Pérez-Martínez (IP)</i>  <b>Año:</b> 2022</p>
<p><b>12.-</b>  <b>Nombre del workshop:</b> 16th International Conference on Integral Methods in Science and Engineering. Minisimposium "Asymptotic Analysis: Homogenization and Thin Structures". Online, hospedado por U. Rio Grande (Brasil)  <b>Tipo de comunicación:</b> conferencia invitada  <b>Título:</b> Local effects and low frequencies in a banded domain.  <b>Autores*:</b> <i>D. Gómez</i>  <b>Año:</b> 2022</p>
<p><b>13.-</b>  <b>Nombre del workshop:</b> 16th International Conference on Integral Methods in Science and Engineering. Minisimposium "Asymptotic Analysis: Homogenization and Thin Structures". Online, hospedado por U. Rio Grande (Brasil)  <b>Tipo de comunicación:</b> conferencia invitada  <b>Título:</b> Boundary homogenization problems for the elasticity system with high contrasts.  <b>Autores*:</b> <i>M.-E. Pérez-Martínez (IP)</i>  <b>Año:</b> 2022</p>

**14.-**

**Nombre del workshop:** 16th International Conference on Integral Methods in Science and Engineering. Minisposium "Asymptotic Analysis: Homogenization and Thin Structures". Online, hospedado por U. Rio Grande (Brasil)

**Tipo de comunicación:** conferencia invitada

**Título:** Spectral gaps in a double-periodic perforated waveguide

**Autores\*:** *R. Orive-Illera (investigador del plan de trabajo)*

**Año:** 2022