Silicon Photomultipliers for Gamma Radiation Detectors in Nuclear Medicine Applications

by

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"Warning: If you are reading this then this warning is for you. Every word you read of this useless fine print is another second off your life. Don't you have other things to do? Is your life so empty that you honestly can't think of a better way to spend these moments? Or are you so impressed with authority that you give respect and credence to all that claim it? Do you read everything you're supposed to read? Do you think every thing you're supposed to think? Buy what you're told to want? Get out of your apartment. Meet a member of the opposite sex. Stop the excessive shopping and masturbation. Quit your job. Start a fight. Prove you're alive. If you don't claim your humanity you will become a statistic. You have been warned."

— Chuck Palahniuk, Fight Club.

PUBLISHED AND SUBMITTED CONTENT

Journal Articles:

[1]Perez-Benito, D., **R. Chil**, J.M. Udias, M. Desco, and J.J. Vaquero. 2018. "SiPM-Based PET Detector Module for a 4π Span Scanner." *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, November. https://doi.org/10.1016/J.NIMA.2018.10.179.

(Author Contributions: Rigoberto Chil was responsible for designing and testing the case studies; David Pérez and Rigoberto Chil contributed equally. All authors were responsible for conceptualizing the framework, writing, editing & reviewing the paper.)

Conference Proceedings:

[2] **Chil, R.**, L. M. Fraile, J. Vaquero, E. Picado, A. Rodriguez-Moreno, M. C. Rodriguez-Sanchez, S. Borromeo, M. Desco, J. M. Udías, and J. J. Vaquero. 2014. *Advanced Networked Modular Personal Dosimetry System. IFMBE Proceedings*. Vol. 41. Springer, Cham. https://doi.org/10.1007/978-3-319-00846-2_346.

(Author Contributions: Rigoberto Chil was responsible for designing and testing the case studies; All authors were responsible for conceptualizing the framework, writing, editing & reviewing the paper.)

[3] **Chil, R.**, G. Konstantinou, L.M. Fraile, J. Vaquero, C. Rodriguez, S. Borromeo, M. Desco, J.M. Udias, and J.J Vaquero. 2016. "Personal Dosimetry Geolocalized System for Radiation Monitoring." In *2016 IEEE Nuclear Science Symposium, Medical Imaging Conference and Room-Temperature Semiconductor Detector Workshop (NSS/MIC/RTSD)*, 1–2. IEEE. https://doi.org/10.1109/NSSMIC.2016.8069698.

(Author Contributions: Rigoberto Chil was responsible for designing and testing the case studies; All authors were responsible for conceptualizing the framework, writing, editing & reviewing the paper.)

[4] **Chil, R.**, G. Konstantinou, M. Desco, and J. J. Vaquero. 2015. "Highly Multiplexed DOI PET Detector Based on SiPM Sensors." In *2015 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC)*, 1–3. IEEE. https://doi.org/10.1109/NSSMIC.2015.7582150.

(Author Contributions: Rigoberto Chil was responsible for designing and testing the case studies; All authors were responsible for conceptualizing the framework, writing, editing & reviewing the paper.)

[5] **Chil, R.**, G. Konstantinou, M. Desco, and J.J Vaquero. 2016. "Compact, MR Compatible SiPM Small Animal PET DOI Detector." In *2016 IEEE Nuclear Science Symposium, Medical Imaging Conference and Room-Temperature Semiconductor Detector Workshop (NSS/MIC/RTSD)*, 1–2. IEEE. https://doi.org/10.1109/NSSMIC.2016.8069413.

(Author Contributions: Rigoberto Chil was responsible for designing and testing the case studies; All authors were responsible for conceptualizing the framework, writing, editing & reviewing the paper.)

[6] Perez-Benito, D., R. Herrera, **R. Chil**, G. Konstantinou, J.M. Udias, M. Desco, and J.J. Vaquero. 2017. "Proposal for a PET Scanner with 4π Formula Steradian Span." In *2017 IEEE Nuclear Science Symposium and Medical Imaging Conference (NSS/MIC)*, 1–4. IEEE. https://doi.org/10.1109/NSSMIC.2017.8532648.

(Author Contributions: Rigoberto Chil was responsible for designing and testing the case studies; All authors were responsible for conceptualizing the framework, writing, editing & reviewing the paper.)

Patents:

[7] Konstantinou, G. Vaquero, J, J. **Chil, R.** and Desco, M. Celda Centelleadora. ES2665888B1, issued 2016. https://patents.google.com/patent/ES2665888B1/.

(Author Contributions: Rigoberto Chil was responsible for designing and testing the case studies; All authors were responsible for conceptualizing the framework, writing, editing & reviewing the patent.)

The work carried out in all publications is partly included in this thesis in Chapters 3, 4 and 5. The material from these publications are not singled out with typographic means and references.