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Opening a new window on the southern stars for less money: PAIX the first Antarctica polar mission photometer

Merieme Chadid ; Jean Vernin ; Lyu Abe ; Karim Agabi ; George Jumper ; George W. Preston ; Chris Sneden ; Liyong Liu ; Yongqiang Yao ; H.-S Wang ; Éric Aristidi ; J.-P. Rivet ; Marcel Carbillet ; Ch. Giordano ; E. Bondoux ; L. Moggio ; H. Trinquet

[+] Author Affiliations

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Ground-based and Airborne Instrumentation for Astronomy VI
Christopher J. Evans; Luc Simard; Hideki Takami
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Abstract**abstract**

In this invited paper, we implement a new way to study the stellar oscillations, pulsations and their evolutionary properties with long uninterrupted and continuous precision observations over 150 days from the ground, and without the regular interruptions imposed by the earth rotation. PAIX—First Robotic Antarctica Polar Mission— gives a new insight to cope with unresolved stellar enigma and stellar oscillation challenges and offers a great opportunity to benefit from an access to the best astronomical site on Earth – DomeC—. The project is made of low cost commercial components, and achieves astrophysical measurement time-series of stellar physics fields, challenging photometry from space that shows large gaps in terms of flexibility during the observing runs, the choice of targets, the repair of failures and the inexorable high costs. PAIX has yet more advantages than space missions in observing in UVB RI bands and then collecting unprecedented simultaneous multicolor light curves of several targets. We give a brief history of the Astronomy in Antarctica and describe the first polar robotized mission PAIX and the outcome of stellar physics from the heart of Antarctica during several polar nights. We briefly discuss our first results and perspectives on the pulsating stars and its evolution from Antarctica, especially the connection between temporal hydrodynamic phenomena and cyclic modulations. Finally, we highlight the impact of PAIX on the stellar physics study and the remaining challenges to successfully accomplish the Universe explorations under extreme conditions. © (2016) COPYRIGHT Society of Photo-Optical Instrumentation Engineers (SPIE). Downloading of the abstract is permitted for personal use only.

Topics

Astronomy ; Heart ; Photometry ; Physics

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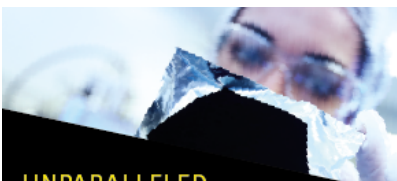
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