PULSAR DIAGNOSTICS USING THE SHAPES OF PULSES AND SPECTRA OF HE EMISSION

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We connect numerical 3D-simulations of electromagnetic cascades in pulsar magnetospheres with the observed characteristics of classical and millisecond pulsars. We argue that despite inconsistencies plagueing theoretical models of inner-gaps they do provide reliable benchmarks against which to analyse HE data. Specifically, it is possible then to address the following aspects of pulsar activity and orientation: - on/off-beam viewing geometry, - high-altitude acceleration and emission, - residual acceleration of secondary pairs. Moreover, we present subtle propagation effects induced by rotation as well as phase-resolved spectra and we discuss their potential significance in discriminating between various models.