1131-13-319   **Tucker Kevin*** (`kftucker@uic.edu`), 851 S Morgan St, UIC MSCS SEO m/c 249, Chicago, IL 60607-7045, Chicago, IL 60607, and **Smirnov Ilya**. *F-signature of Cartier Modules.*

The F-signature of a local ring R in positive characteristic measures singularities by analyzing the asymptotic behavior of splittings of the iterated Frobenius endomorphism. It has a number of useful properties: it detects singularity and F-regularity, respects localization, and determines a semicontinuous function on $\mathrm{Spec}(R)$. Several attempts have been made to define an analogous invariant for F-rationality: Hochster-Yao introduced the F-rational signature $s_{rat}(R)$ and later Sannai defined the dual F-signature $s(\omega_R)$. Yet neither of these invariants share all of the desirable properties of the F-signature. We propose a definition of the F-signature $s(\phi)$ of a Cartier module (M, ϕ), in the sense of Blickle-Böckle. With mild assumptions, this invariant detects F-regularity, and gives a lower semi-continuous function. The most important example comes from the trace of Frobenius $Tr_F \colon (\omega_R)^{1/p} \to \omega_R$. We refer to $s(Tr_F)$ as the Cartier signature, and like the dual and F-rational signatures, it detects F-rationality; additionally, the Cartier signature respects localization and is semicontinuous. (Received July 17, 2017)

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