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On the L-series of F. Pellarin

David Goss

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The calculation, by L.\ Euler, of the values at positive even integers of the Riemann zeta function, in terms of powers of π and rational numbers, was a watershed event in the history of number theory and classical analysis. Since then many important analogs involving L-values and periods have been obtained. In analysis in finite characteristic, a version of Euler's result was given by L.\ Carlitz \cite{ca2} in the 1930's which involved the period of a rank 1 Drinfeld module (the Carlitz module) in place of π. In a very original work \cite{pe2}, F.\ Pellarin has quite recently established a "deformation" of Carlitz's result involving certain L-series and the deformation of the Carlitz period given in \cite{at1}. Pellarin works only with the values of this L-series at positive integral points. We show here how the techniques of \cite{go1} also allow these new L-series to be analytically continued -- with associated trivial zeroes -- and interpolated at finite primes.

Comments:	In this version we show the entireness in terms of both x^{-1} and Pellarin's variable t in Theorem . To appear in the Journal of Number Theory volume in honor of David Hayes
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