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**Vicky Williams Klima\*** ([klimavw@appstate.edu](mailto:klimavw@appstate.edu)), Department of Mathematical Sciences, Appalachian State University, Boone, NC 28608, and **Kailash C. Misra** ([misra@math.ncsu.edu](mailto:misra@math.ncsu.edu)), Department of Mathematics, North Carolina State University, Raleigh, NC 27695. *Root Multiplicities of the Indefinite Kac-Moody Algebras  $HC_n^{(1)}$ .*

We study the root multiplicities of the indefinite Kac-Moody algebras  $HC_n^{(1)}$  by viewing them as weight multiplicities of certain integrable  $C_n^{(1)}$ -modules. Then using Weyl-conjugacy and the path crystal for integrable  $C_n^{(1)}$ -modules we calculate the multiplicities of a family of roots for  $HC_n^{(1)}$ . In particular, we show that for any positive integer  $k$ , the multiplicity of  $-2\alpha_{-1} - k\delta$  as a root of  $HC_n^{(1)}$  is a polynomial in  $n$  of degree at most  $k$ . (Received March 06, 2006)