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High Energy Physics - Theory

W-extended Kac representations and integrable boundary conditions in the logarithmic minimal models WLM(1,p)

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(Submitted on 24 Jun 2011)

We construct new Yang-Baxter integrable boundary conditions in the lattice approach to the logarithmic minimal model WLM(1,p) giving rise to reducible yet indecomposable representations of rank 1 in the continuum scaling limit. We interpret these W-extended Kac representations as finitely-generated W-extended Feigin-Fuchs modules over the triplet W-algebra W(p). The W-extended fusion rules of these representations are inferred from the recently conjectured Virasoro fusion rules of the Kac representations in the underlying logarithmic minimal model LM(1,p). We also introduce the modules contragredient to the W-extended Kac modules and work out the correspondingly-extended fusion algebra. Our results are in accordance with the Kazhdan-Lusztig dual of tensor products of modules over the restricted quantum universal enveloping algebra $\bar{U}_q(sl_2)$ at $q=e^{\pi i/p}$. Finally, polynomial fusion rings isomorphic with the various fusion algebras are determined, and the corresponding Grothendieck ring of characters is identified.

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