

**A CONTRAVARIANT FORM ON TENSOR PRODUCT OF
HIGHEST WEIGHT MODULES AND EXTREMAL
COCYCLE**

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Abstract: The product of contravariant forms on irreducible highest weight modules V, Z over a quantum group is responsible for complete reducibility of $V \otimes Z$: it is completely reducible if and only if the restriction of the form to the span of singular vectors in $V \otimes Z$ is non-degenerate. We relate the pullback of this form to a certain subspace in V or, alternatively, in Z parameterizing singular vectors in $V \otimes Z$ with the extremal cocycle of Zhelobenko. We consider the case of parabolic module Z in some detail and express the inverse contravariant form of Z through the extremal projectors. As an application, we give an explicit formula for equivariant quantization of semisimple conjugacy classes with Levi isotropy subgroups through the extremal projectors.