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**Franz Gähler\*** (gaehler@math.uni-bielefeld.de). *Decorated silver mean chain with mixed spectrum.*

We present a decorated version of the silver mean chain (SMC), which has a mixed diffraction spectrum with a pure point and a singular continuous component. This decorated SMC is generated by a primitive substitution rule. Geometrically, the tiles are the same as for the usual SMC, but tiles come now in two colors each. If tiles of opposite color are decorated with weights of opposite sign, a structure with a continuous diffraction spectrum is obtained, which is at least partially singular. Conversely, if tiles of opposite color are decorated the same way, the usual SMC is recovered, which has pure point spectrum. A generic decoration thus leads to a structure with mixed spectrum.

Examples of this kind can be constructed in a systematic way, also in higher dimensions. Starting with a substitution tiling known to be pure-point diffractive, we can split each tile into two subtypes, a barred and an unbarred variant. The two variants are then coupled by a suitable twist in the substitution rule, so that the twisted rule commutes with the bar operation. Under certain conditions, which we shall discuss and which are frequently met, a substitution tiling with mixed spectrum is obtained. (Received January 27, 2014)