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Paul M Terwilliger* (terwilli@math.wisc.edu), Math Department, U. Wisconsin, 480 Lincoln Drive, Madison, WI 53706. *The alternating PBW basis for the positive part of $U_q(\widehat{\mathfrak{sl}}_2)$.*

The positive part U_q^+ of $U_q(\widehat{\mathfrak{sl}}_2)$ has a presentation with two generators A, B that satisfy the cubic q -Serre relations. We introduce a PBW basis for U_q^+ , said to be alternating. Each element of this PBW basis commutes with exactly one of $A, B, qAB - q^{-1}BA$. This gives three types of PBW basis elements; the elements of each type mutually commute. We interpret the alternating PBW basis in terms of a q -shuffle algebra associated with affine \mathfrak{sl}_2 . We show how the alternating PBW basis is related to the PBW basis for U_q^+ found by Damiani in 1993. (Received July 07, 2019)