The silylium ion \([\text{C}_6\text{(SiMe}_2\text{)}(\text{SiHMe}_2)_5]^+\) offers an amazing example of multiple Si···H interactions in organic chemistry. It shows a symmetric Si\(^\alpha\)–H–Si\(^\alpha\) motif supported by two additional Si\(^\beta\)–H···Si\(^\alpha\) agostic interactions. This cation is highly fluxional in NMR spectra at room temperature. This fluxionality is attributed to scrambling of the hydride bridge around the benzene ring. The DFT calculations show that the hydride shift is related to internal rotation of silyl groups. We found two possible mechanisms of this process, associated with internal rotation of either \(\beta\)- or \(\gamma\)-silyls. We performed NMR, static DFT, and dynamics studies of this process. The energy barrier of the process is largely caused by internal rotation of the silyl group, whereas the hydride transfer itself is intrinsically an easy process. The related cation \([1,4-\text{C}_6(\text{SiMe}_2)(\text{Me})(\text{SiHMe}_2)_4]^+\) has a fully different structure with two equivalent Si–H bonds coordinated to a single silylium center, affording a pentacoordinate silicon atom featuring a double Si–H···Si···H–Si agostic bond.