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## THE MUTUAL INTERACTION BETWEEN SQUISH AND TUMBLE IN COMBUSTION CHAMBER WITH CYLINDRICAL BOWL

UDC: 621.43

In this paper some results concerning the mutual interaction between squish and tumble and its effect on flame front shape and its displacement through combustion chamber geometry of s.i engine consisting of flat head with two vertical valves and cylindrical bowl were presented. These results obtained with KIVA3V code were compared with results of flame front shape and its displacement obtained for the case with no valves i.e. without tumble. In order to alleviate the application of KIVA3V code and to enhance its flexibility two additional computer codes were applied as well, i.e. AVL TYCON code intended for cam design calculations and calculations of the dynamic behavior of timing drives and gear transmission units and AVL BOOST code intended for engine cycle calculations, including 1.5D fluid flow calculations through pipelines. The first code was used for the calculation of valve lift curve while the other was used for the calculation of relevant data set in valve regions. It was found that for particular combustion chamber shapes considered the entirely different flame front shapes and propagation velocities were encountered for these two cases ensuing primarily from the entirely different fluid flow patterns in the vicinity of TDC

**Key words:** *combustion chamber, squish, tumble*

## INTERAKCIJA RADIJALNOG STRUJANJA I TB VRTLOGA U CILINDRIČNOJ KOMORI ZA SAGOREVANJE

U radu su prezentirani neki rezultati interakcije radijalnog strujanja i prevrtanja usisne struje oko y-ose (TB vrtloga) i uticaja te interakcije na oblik fronta plamena i njegovo prostiranje u komori za sagorevanje benzinskog motora koja se sastoji od ravne glave sa vertikalno postavljenim ventilima i cilindrične komore u klipu. Rezultati, dobijeni pomoću KIVA3V kompjuterskog programa, su komparirani sa rezultatima koji se odnose na oblik fronta plamena i njegovo prostiranje u slučaju bez ventila, tj. bez TB vrtloga. U cilju olakšane primene KIVA3V programa i povećanja njegove fleksibilnosti primenjena su još dva kompjuterska programa tj. AVL TYCON kompjuterski program, namenjen za proračun profila brega i dinamike ventila, i AVL BOOST program, namenjen za proračun ciklusa motora zajedno sa 1.5D sračunavanjem strujanja kroz cevovode. Prvi program je iskorišćen za sračunavanje krive podizanja ventila dok je drugi iskorišćen za sračunavanje relevantnih podataka u regionu ventila. Zaključeno je da se za razmatranu geometriju komore za sagorevanje, u ova dva slučaja, dobijaju potpuno različiti rezultati oblika fronta plamena i brzine njegovog prostiranja koji proističu iz potpuno različite strujne slike u blizini SMT.

**Ključne reči:** *komora za sagorevanje, strujanje, vrtlog*