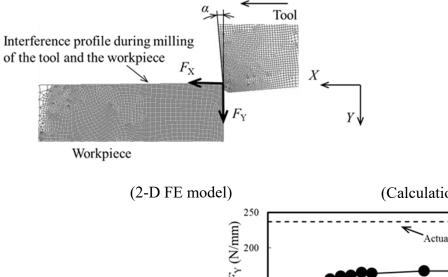
FEM analysis of cutting phenomenon

 $\sim$  Orthogonal cutting of Titanium alloy\*  $\sim$ 



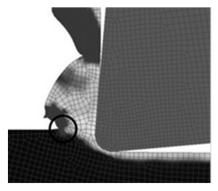
▶ FEM simulation for the orthogonal cutting of Ti-6Al-4V alloy in consideration of a ductile fracture condition was investigated.

► The constants values of flow stress equation and the limit value of ductile fracture condition for the simulation were determined.



0

0.05



(Calculation result of the generation of the saw-tooth type chip) Cutting force  $F_{\chi}$ ,  $F_{\gamma}$  (N/mm) 05 00 05 00 00 Actual value of  $F_{\rm X}$ Cutting speed V = 50 m/min . value of  $F_{\rm x}$ Tool rake angle  $\alpha = -5^{\circ}$ Cutting feed f = 0.1 mm/revCal. value of  $F_{\gamma}$ 0

0.2 0.25 Limit value of fracture  $D_{\rm f}$ 

0.15

(Relation between the cutting force and the limit value of fracture in turning process)

0.1

\* M. Nikawa, et al., Mechanical Engineering Journal, Vol.3, No.2(2016), DOI: 10.1299/mej.15-00536