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Sommario/riassunto	Long description: Aero engine bearing chambers are complex machine elements inside the engines, supporting up to three concentric shafts on bearings. For safety reasons, the aero engines always employ rolling-element type bearings and therefore require a sufficient oil supply for lubrication in order to guarantee a reliable operation. As a consequence, a complex two-phase flow consisting of oil and sealing air governs the bearing chambers. A highly dynamic oil film, flowing along the chamber walls, plays a vital role to fulfill the tasks of cooling, lubricating and cleaning the bearing chambers. The design and optimization process of the bearing chambers requires a detailed understanding in order to accurately simulate the film behaviour inside the bearing chambers. Based on the earlier experimental investigations, it is known that near the scavenge off-take a relatively thick film exists. The numerical model to simulate these films must therefore take into account the elliptical behaviour of such films. Among the different models, the Volume Of Fluid (VOF) Model offers the best compromise between accuracy and efforts. However, preliminary attempts to model a fully developed and turbulent test case from literature revealed an unphysical pressure drop and velocity profile in the gas phase above the film flow. An inadequate turbulence modelling near the gas-liquid interface was identified as the problem source. The 2-Equation

turbulence models (k-Îµ& k-Ï) were extended to achieve a substantial improvement.