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## [263] On the further development of Nb3Sn SRF cavities: The investigation of Ta thin films as a diffusion barrier

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The accelerator science has long sought to increase the quality factor of SRF cavities. The approach is to use  $Nb_3Sn$  in a thin film form grown on Cu. One main advantage of  $Nb_3Sn$  is its high critical temperature- twice the currently used Nb. The challenge of growing  $Nb_3Sn$  directly on Cu is multiple and requires the use of a barrier layer in between  $Nb_3Sn$  and Cu. This work hence propose Ta as the barrier layer, which was fully investigated prior to the  $Nb_3Sn$  sputter deposition. The results will show that Ta is indeed preventing for any Cu inter diffusion, hence allowing a optimal growth of the  $Nb_3Sn$  on top.

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