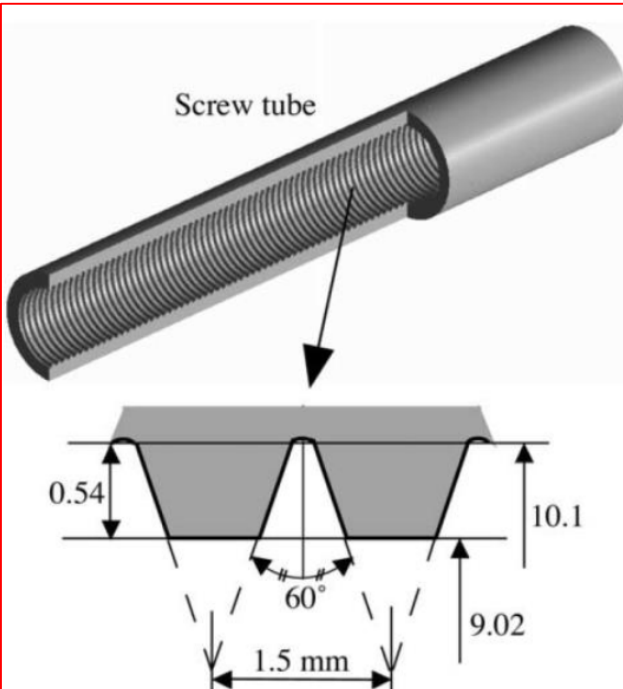


Computational Fluid Dynamic analysis of Screw tube relevant for fusion applications



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- A screw tube is a cooling tube with a helical triangular fin on its inner cooling surface.
- The nut-like inner surface can work as a combination of enlargement of heat transfer area and turbulence promoter of cooling water near the surface to enhance heat transfer.
- Heat removal capability of the screw tube is twice as high as that of a smooth, 1.5 times higher than swirl tube.

Objective:

Heat transfer analysis of the screw tube, to understand the underlying physics using computational thermal fluid dynamics.

Tested turbulence models

1. K-epsilon (standard, RNG, realizable),
2. K-omega (standard, SST, BSL),
3. Reynolds stress model,
4. Scale adaptive simulation,
5. Spalart - Allmaras model,
6. Detached eddy simulation models (Realizable k-epsilon, Spalart – Allmaras, SST).

