Guided discussion:

Alternative Nb_3Sn growth methods - What are the challenges and next steps?

There is growing interest in developing Nb_3Sn growth techniques:

- Compatible with lower melting temperature substrates (Cu)
- Taking advantage of easily castable and cheaper material (CuSn)
- Allowing sequential growth of S and I layers for SIS multilayers

Nb_3Sn SRF applications on Cu or as base for SIS multilayers preclude the use of the Sn vapor diffusion technique due to the necessary high temperature cycles.

- What are the currently most prevalent challenges for the development of Nb_3Sn with
  - "Bronze route" and electro-plating techniques?
  - Conventional PVD techniques?
- As with any thin film technique, the **SUBSTRATE** is key in the development of Nb_3Sn based SRF surfaces. What are the current " hurtals" in substrate quality, impurities, roughness, surface preparation…
- Can we produce film with reduced roughness compared to Sn diffusion process?
- Can we achieve higher control in resulting film characteristics (stoichiometry, structure …) with alternative deposition techniques?
- **Fundamental studies**
  - How can we manipulate energetics to get more uniform nucleation?
  - How do the GBs differ from films produced by Sn vapor deposition?
  - Film growth– interfaces, buffer layer, nucleation, hetero-epitaxy