CFETR

Preliminary consideration on basic requirements

-- diagnostic and CODAC

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- The systems of diagnostics and CODAC would to be decided after the mission defined and physics designed.

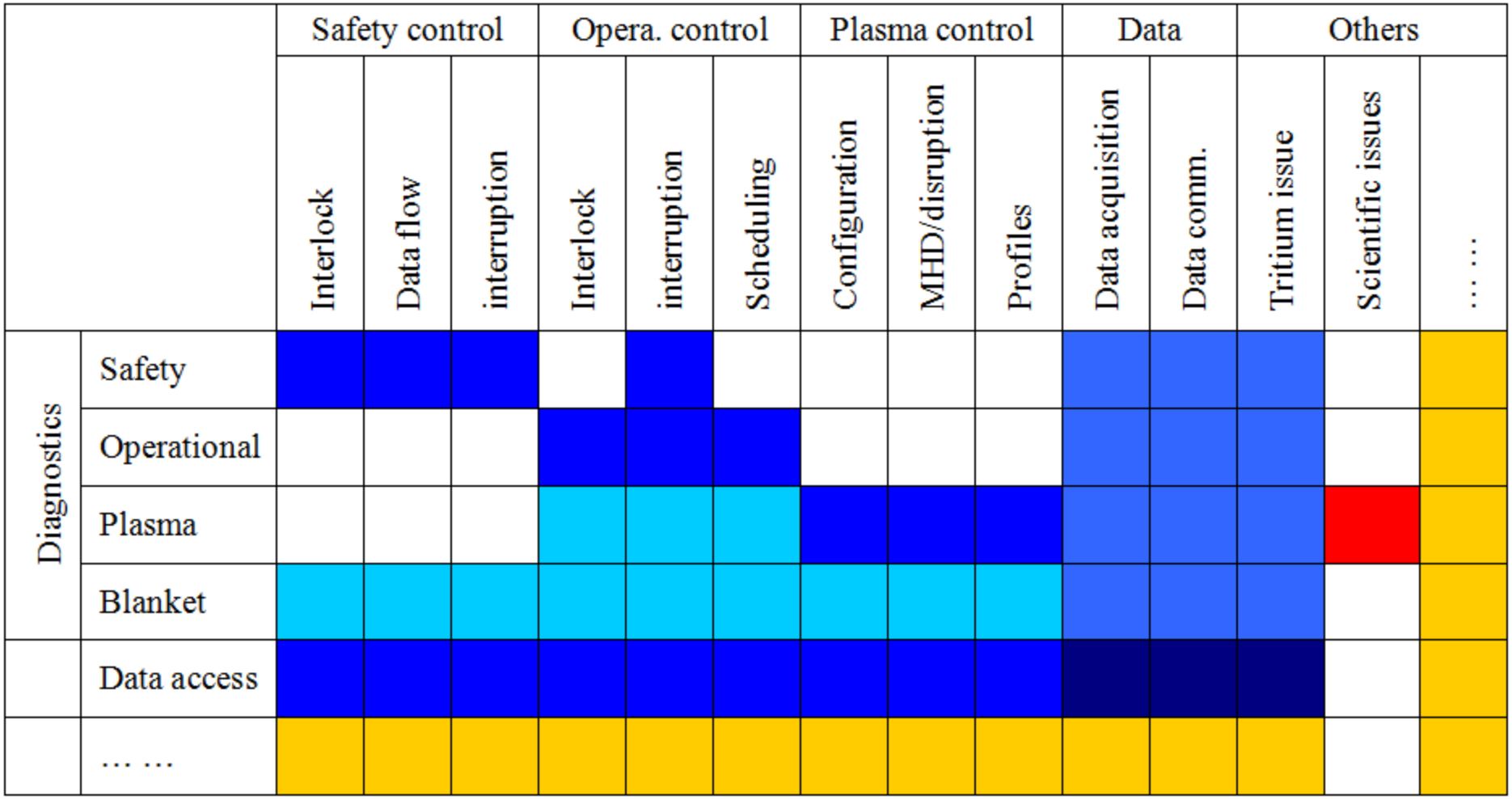
CODAC

- **Safety control:** interrupt for serious events: nuclear, fire, earthquake, …; interlock for nuclear, entries, …
- **Operational control:** operation scheduling; interlock for power supply, vacuum, heating, fuelling, cooling, …; interrupt for serious events.
- **Plasma control:** shape, configuration, MHD, disruption, …
- **Data:** acquisition, access, communication, display, …
- **Others:** tritium breeding control, … according to decided mission.

Plasma diagnostics

- **Configuration:** plasma shape, displacement, …
- **Plasma parameters & profiles:** density, temperature, radiation/emission, current density, bate, storage energy, rotation, D/T ratio, …
- **MHD instability:** NTM, ELM, AEs, RWM, …
- **Fusion production:** neutron & profiles, alpha particle, gamma ray, fusion power, …
- **Divertor and firstwall:** radiation, heat load, erosion, damages, …
- **Others:** Tritium retention, scientific study needs. …

CODAC and diagnostics



Big challenge of diagnostics

- **Long time measurement:** for plasma feedback control, …
- **Surviving form radiation:** neutron, gamma ray.
- **Reliable diagnostics:** the current used diagnostics are too complicated for reactor. To explore the simple diagnostic systems and methods are necessary – integration diagnostic?
- **New diagnostics development:** for new studies in material, blanket, …

Thank you for your attention