(Some) open questions

- Potential need for self-consistent CRM for molecules inside EIRENE (for each cell)?
- (Total) molecular radiation in the energy balance, to be returned to plasma code
- CX processes between electronically excited atoms with plasma ions?

- Status of HYDKIN (tool)? (removed from eirene.de website)

Notes and minutes of meeting (Mathias)

- Options for H_2 CRM in support of EIRENE-NGM development/physics
  - Detlev's Sawada code (using AMJUEL, HYDHEL, H2VIBR)
  - Andreas' CRUMPET (using AMJUEL, HYDHEL, H2VIBR)
  - Dirk's/Ursel's YACORA

⇒ Preference for YACORA as code with the most developed and up-to-date AM data (see Dirk's presentation)

⇒ Current YACORA:

- Started with Sawada datasets → latest MCCC data, Curtin University connection, formatted ASCII input for hydrogen and hydrogen isotopologues
- Integration of equations rather than linearization as in Greenland ⇒ non-linear effects, optical thickness
- Mock-up of transport effects through diffusion ⇔ EIRENE transport
- Surface effect, release/reflection of excited molecules

Notes and minutes of meeting (Mathias)

- Start with cross-comparison of EIRENE output using AMJUEL and YACORA
  - Andreas' 1-D slab ⇒ realistic MAGNUM-PSI and JET L-mode cases
  - Start with YACORA on the Web → training in executing YACORA as project progresses, sharing of executable to be discussed when ready
  - Discussion of making YACORA part of EIRENE when determined beneficial
  - Start with hydrogen case, then move to deuterium, tritium, DT
- mdf files (Molecular ADAS) could potentially replace AMJUEL (for cross-sections and rates), but running up-to-date CRM necessary to verify and validate models ⇒ significant development, manpower? How to address multidimensionality of parameters (past n_e and T_e dimensions)?
- JKU?
- Dmitriy/Mathias to get in contact with Jorge Gonzalez-Munoz/Egbert Westerhoff for SOLPS-ITER, Ivo Classen for AM spectroscopy at MAGNUM-PSI

Notes and minutes of meeting (Mathias)

- Mathias to summarize JET L-mode measurements (W surface)
  - H_2 vs D_2 (T_2 and DT) → Fulcher band measurements
  - Comparison cases for H_2 and D_2 DIII-D L-mode cases with HR-UV (potentially, Lyman-Werner bands), Fulcher band, Divertor Thomson Scattering → carbon surface = resurrect previous knowledge

Notes and minutes of meeting (Dmitriy)

- AMJuel (H2Vibr, HydHel...) need to be kept online and need some checks/updates.
- HydKin is gone offline - this should be investigated.
- Online data (www.eirene.de) and the unpublished book from Detlev should be kept online but not necessarily 100%
- YACORA contains the most up-to-date and extensive data set for fusion-relevant molecular species. Nonetheless, keeping all the Detlev's EIRENE datasets remains of value at least for years.
- Improved EIRENE-NGM can use CRMs based on a) YACORA output, b) ADAS-EU mdf (manpower issue), c) CRUMPET (Python, not really recommended even by Andreas). Building on the old Detlev's models is also less desirable than YACORA.

Notes and minutes of meeting (Dmitriy)

- YACORA (and databases) will be available as an executable (after clarification the licencing and similar issues). The C++ source may be useful at the end, however, discussion on that makes no sense before trying/getting experience with the use of the executable
- YACORA is more than just a balance equation solver. It can treat diffusion and opacity, however in local equilibrium assumption (no photon tracing or transport, no geometry included).
- MAGNUM-PSI (rotationally symmetric column of plasma) is an attractive test bed for the CRMs to be refined (developed?..) and used in EIRENE simulations.

Next steps

- Next steps:
  - Andreas to provide EIRENE profiles and analyses based on 1D hydrogen slab
  - Comparison of AMJUEL and YACORA input data and post-processing of EIRENE output ⇒ need prioritized list of input/output data
  - Smaller-circle Zoom meeting by mid-June 2021, Andreas to visit IPP Garching (probably, hopefully) in September 2021
  - Summary of activities to TSVV-5 group in October/November 2021