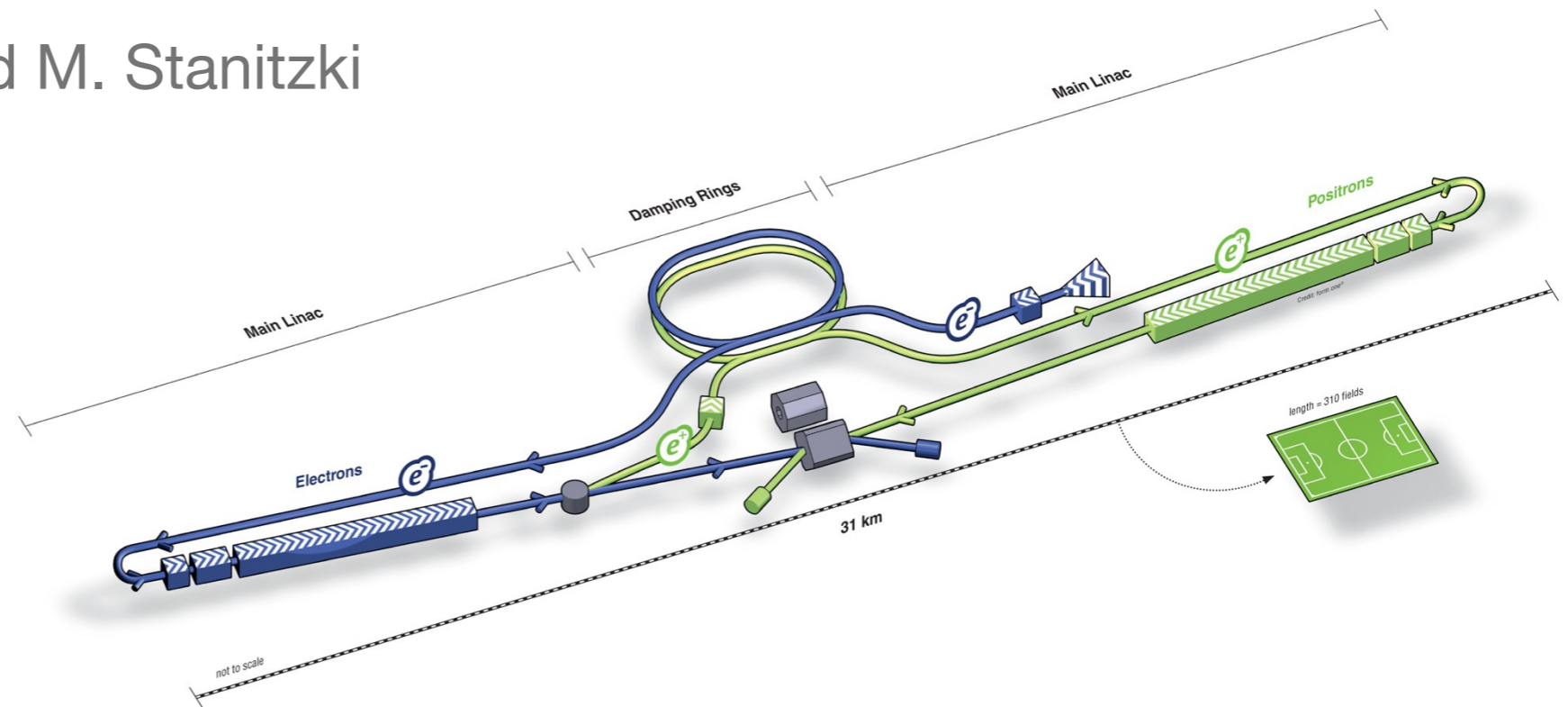




E-JADE

WP3: Linear Collider targeted R&D

E. Elsen with K. Büßer and M. Stanitzki



E-JADE Kick-off Meeting, CERN, 16.2.2015

Goals of Work Package 3

- Based on the ILC TDR and the chosen Japanese site provide site-specific optimisation of the design and implementation.
- International ILC preparation team forms, including key roles for ~10 European accelerator scientists. Visits to Japan mandatory.
 - Site-specific design for ILC in Japan
 - Project implementation plan involving European participation at an appropriate level.

Tasks of Work Package 3

- **EDMS** (CERN, DESY & KEK): Develop the scheme for an internationally accessible EDMS, which complements the Japan-specific engineering efforts and builds on European experience with large-scale projects. The Machine and Detector Integration and SRF activities will act as starting points.
- **Machine and Detector Integration** (CERN, CNRS, DESY & UOXF): Refine the description of the ILC Machine-Detector Interface to include the site-specific requirements while still meeting the demanding performance goals at high luminosity. Integrate the current detector assembly and installation plans with the conditions at the Iwate site. This also includes the required detector infrastructure and services.
- **Superconducting RF** (CERN, CEA, DESY & KEK): Optimise the SRF production procedures for use at the ILC and define integration procedures for the multiply-sourced cavities.
- **LC Optimisation**: (CERN, CNRS, DESY & KEK): A high-intensity positron source is an important component of any LC. Positron polarisation is highly desirable and integral part of such a source. A common platform for CLIC and ILC has already been established which allows progress in this area. – There is a long-standing collaboration between Europe and KEK on development and testing of 12 GHz copper RF structures for use at a CLIC-based LC.

Topics

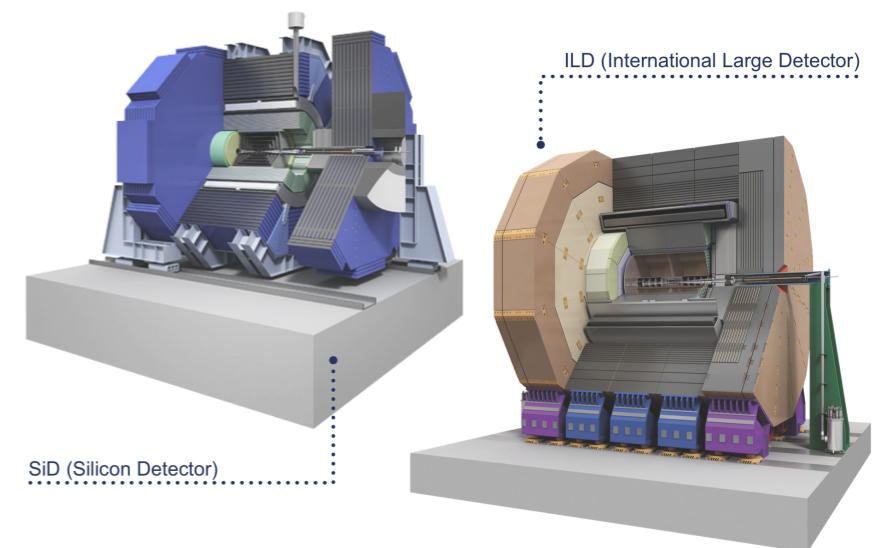
- Electronic Data Management System
- Machine detector interface
 - Adapt current detector concepts to realities of Kitakami site
- Superconducting rf developments
 - Exploit synergies of European and Japanese installations
- LC Optimisation
 - Positron source development
 - Development of CLIC accelerating structures

Electronic Data Management System

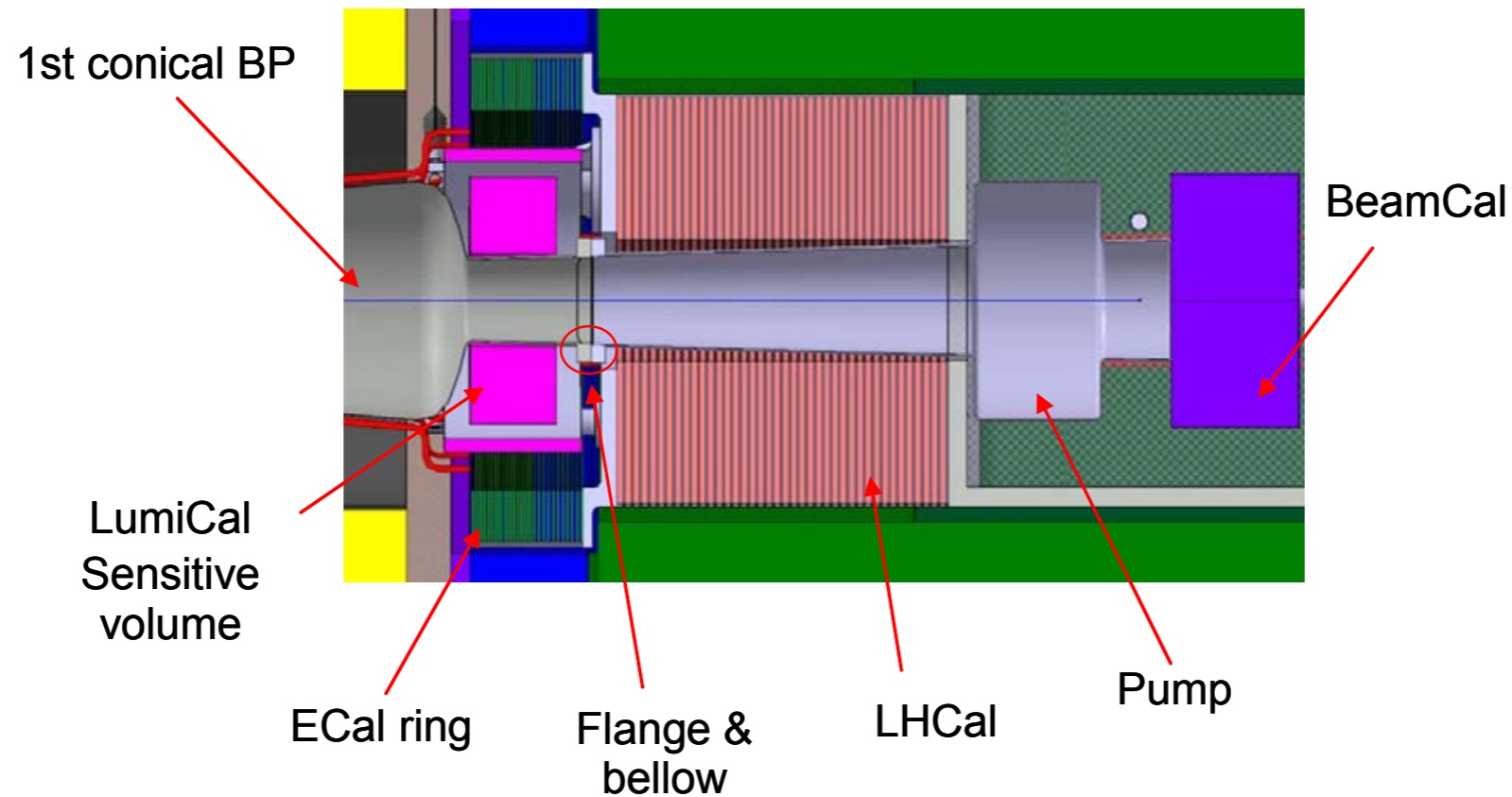
- a functional electronic data management is mandatory
 - global access
 - tracking and versioning
 - consistency
- DESY has gained experience from the EDMS for the European XFEL

Machine-Detector Interface

- Push-Pull is the physics preferred solution with two detector concepts ILD and SiD
- TDR presents a generic case for the realisation of such a scheme
- Kitakami site provides new boundary conditions and creates opportunities for cost and functional optimisation
- Detector installation schedules are critical



Forward Region - possible changes towards $L^*=4\text{m}$



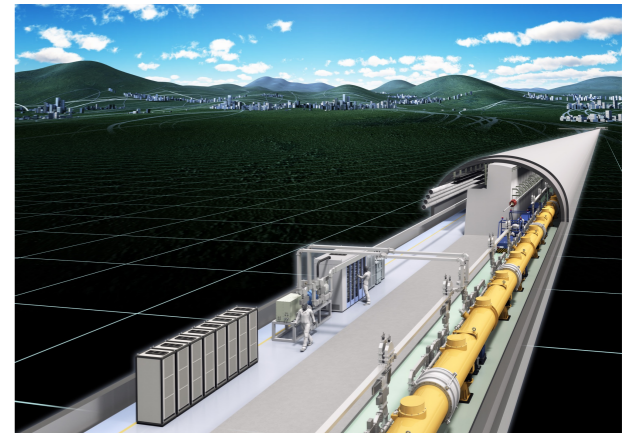
- Need to find ~40cm in current design
- Look into design optimisations of all structures
 - maybe find some 10cm there, but more?
- Biggest devices:
 - Pump in front of BeamCal (30cm)
 - LHCAL (~50cm)

Example ILD

*from K. Büßer
at SiD-WS
Jan 2015*

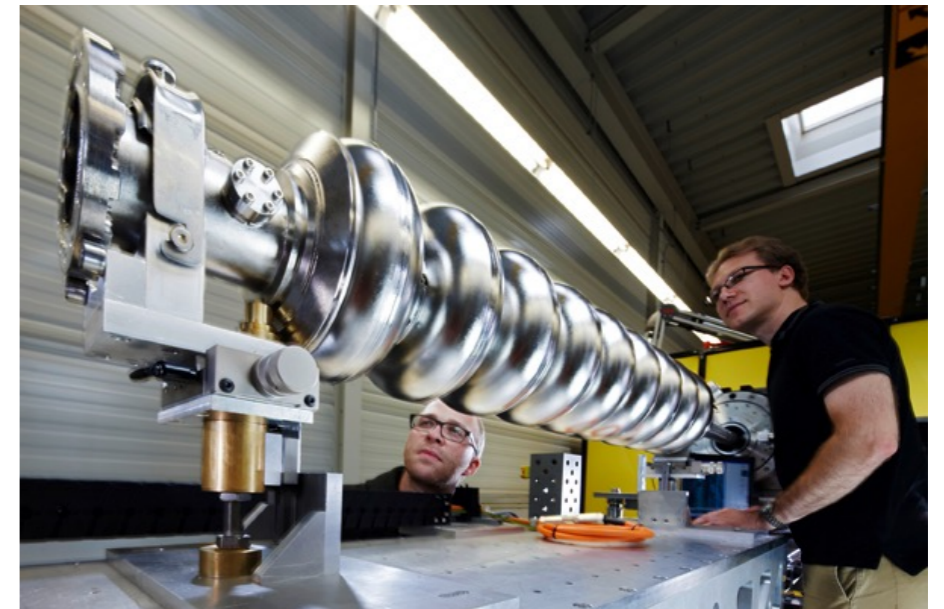
Access to Interaction Point

- Kitakami site foresees (long) horizontal access paths that impose weight and time constraints
- Detector construction schedules can be optimised by surface installation before lowering detector into experimental hall.
- Vertical access shafts imposed boundary conditions on surface access paths that may need to be found



Superconducting RF

- DESY wishes to continue treatment of 24 special cavities (ILC-HiGrade) for highest performance; these cavities have undergone the same treatment as the industrially produced cavities of the European XFEL
- insight on optimum ILC production process including manual fault removal and optimisation
- New methods such as those developed for high-Q
- Use of and feedback for the Japanese installations that are capable of full cavity treatment

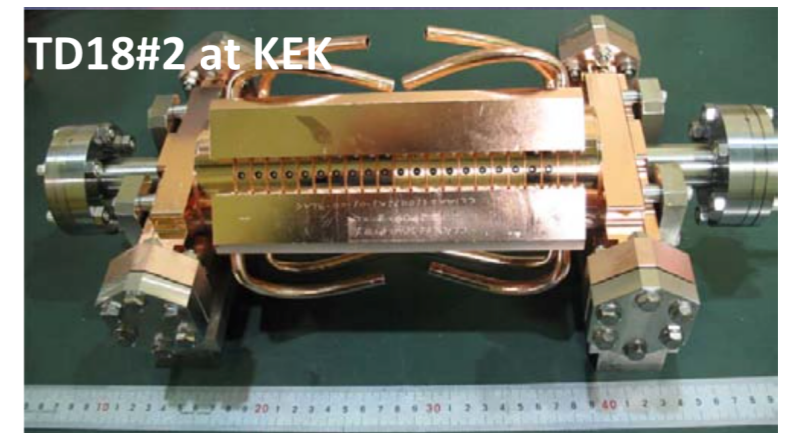
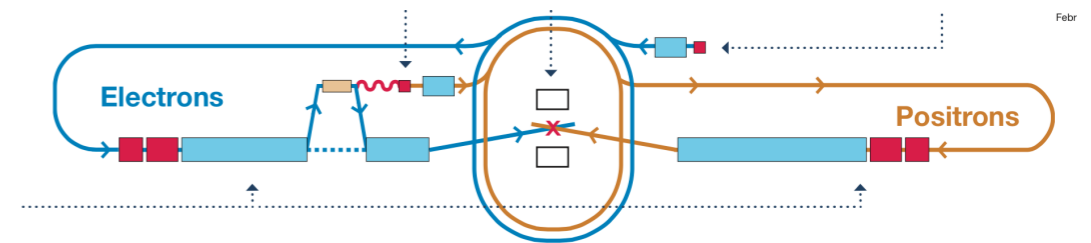


GOAL of SRF Programme

- If Japan will host the ILC
 - Establish international readiness for cavity production with capability in all 3 regions
 - Profit from the experience from the European XFEL while it is available
- else
 - advance the technology for applications in other areas (high current, cw-applications)

LC optimisation

- Positron source
 - intensity and target
- 12 GHz accelerating structures
 - continue development and qualification of structures for CLIC as necessary
- Extended tests in Japan and at CERN



Secondments

- WP3 wishes to use the E-JADE funds for training and exchange of (new) ideas in all four areas
 - EDMS
 - machine detector interface
 - Superconducting rf
 - LC optimisation
 - Positron source development (high intensity)
 - high gradient for 12 GHz structures

Conclusion

- E-JADE will be instrumental in establishing and fostering close collaboration between European laboratories and Japan to further the case of e^+e^- Linear Colliders
- E-JADE will seed the active participation in designing the ILC if the Japanese government decides to host the project in Japan