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FCC-ee beam vacuum challenges, concepts and future R&D plans

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The FCC-ee vacuum system design presents several challenges, stemming from various technical specifications, namely its sheer unprecedented size, a twin-ring design (contrary to LEP's single-ring), and the fact that it needs to accommodate both a low-energy/high-current and high-energy/low-current machines. Another important challenge is the need to condition the various machines in as short time as possible, especially the low-energy Z-pole version, in order to allow the experimenters to integrate as much luminosity as possible prior to moving on to the next beam energy. A final challenge is identified in the design of the MDI area, which needs to avoid as much as possible any synchrotron radiation (SR) photons hitting the vertex area, and manage the extremely high energy SR photons generated along the final focus doublets. The conceptual design of the arc sections will be given, alongside with a preview of the needed R&D studies and prototyping.

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