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Investigation of circuit breaker arc properties in the vicinity of current-zero PATRICK STOLLER, MARTIN SEEGER, ARTHOUROS IORDANIDIS, DANIEL OVER, BERNARDO GALLETI, ABB Switzerland Ltd — In high voltage circuit breakers, the current is interrupted by drawing an arc between two contacts that is axially blown by a high pressure gas flow. The properties of this blown arc and its interaction with the flow immediately before a zero-crossing of the alternating current (current-zero) play an important role in determining if current interruption will be successful. A simple test device designed to represent the key features of a circuit breaker while allowing easy access for measurements was used to investigate a high current arc blown with synthetic air before current-zero. Transparent nozzles were used to permit optical investigations; the nozzles were equipped with pressure sensors to provide information about the flow conditions. The current immediately before the zero-crossing was measured with high resolution using a post-arc current measurement system. The electric field distribution in the arc was measured using a resistively coupled probe. Optical images and measurements of the arc voltage and current prior to zero-crossings of the current were compared to investigate the behavior of the arc immediately before successful and unsuccessful interruption attempts.

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