Appendix I

Calculation of $\phi(r, Z)$

As a first step, we have measured $B_z(r,Z)$, the vertical component of the field generated by the magnets along the *r* axis at different *Z*. Then, we have calculated flux $\phi(r_a, Z)$ when the magnet is at altitude *Z* and the axis of the MgB_2 bulk at radial position r_a with respect to the magnet axis. Since the magnet field is axisymmetric, the points of the superconductor threaded by the same field magnitude are along circles or arcs of a circle (see Figure A1). We have divided the surface of the superconductor in 1 mm large rings and arcs of a ring built against these circles and arcs of a circle and we have calculated the flux of the mean field over thickness *t* threading them. We have added the obtained partial flux to get $\phi(r_a, Z)$. If F_r was measured at an altitude *Z** where $B_z(r,Z)$ had not been measured, $B_z(r,Z^*)$ was determined by a linear interpolation between measurements carried out above and below *Z**.

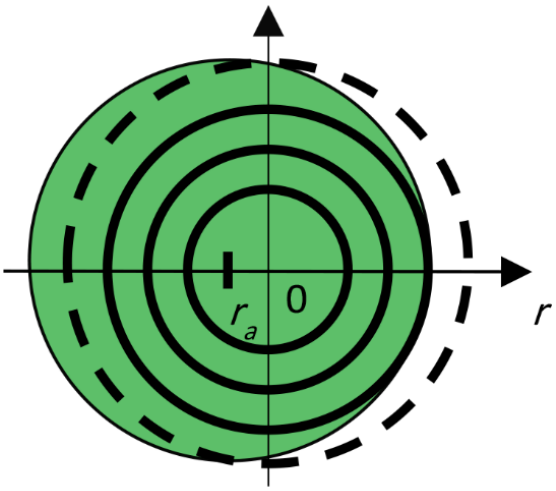

Figure A1 Field generated by the magnet when the axis of the superconductor is at position r_a with respect to the magnet axis. The full lines show points of the superconductor threaded by the same field magnitude located along circles, while the dash line shows points of the superconductor threaded by the same field magnitude that are located along an arc of a circle.