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The double pulsar: tomography of pulsar magnetosphere and a new GR test MAXIM LYUTIKOV, Purdue University — The long awaited discovery of the binary radio pulsar system, PSR J0737-3039A/B, surpassed most expectations, both theoretical and observational, as a tool to probe general relativity, stellar evolution and pulsar theories. Unexpectedly, the faster pulsar A is eclipsed once per orbit while the slower pulsar B shows orbital-dependent variations of intensity. I will describe a model of eclipses which reproduces the complicated observed light curve down to intricate details. This proves the long standing assumption of dipolar magnetic fields of neutron stars and gives a tool to probe details of magnetospheric structure and pulsar emission generation mechanisms. The model also provides a quantitative measurement of relativistic spin precession and offers a new test of theories of gravity.

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