Fix a prime number p and let $\mathbb{C}_p$ denote the completion of an algebraic closure of the field $\mathbb{Q}_p$ of p-adic numbers. Let N be an integer relatively prime to p.

By the work of Hida we know that any eigenform f on $\Gamma_0(pN)$ of weight $k \geq 2$, with Fourier coefficients in $\mathbb{C}_p$ and slope 0, is a member of a p-adic analytic family f_κ of overconvergent p-adic modular eigenforms of slope 0 parametrized by p-adic weights κ for κ ranging through a small p-adic neighborhod of k. *R. Coleman* and *B. Mazur* [In: "Galois representations in arithmetic algebraic geometry" (ed. by A. J. Scholl and R. L. Taylor), Cambridge Univ. Press, 1–113 (1998; Zbl 0932.11030)], constructed "eigencurves", rigid analytic curves over $\mathbb{Q}_p$ whose $\mathbb{C}_p$-valued points parametrise all finite slope normalized overconvergent p-adic modular eigenforms with Fourier coefficients in $\mathbb{C}_p$. *K. Buzzard* [In: "Modular curves and abelian varieties" (ed. by J. Cremona et al.), Prog. Math. 224, 23–44 (2004; Zbl 1166.11322)] formulated definitions of overconvergent p-adic automorphic forms for GL_1 over a number field, and for $D^\times$, D a definite quaternion algebra over $\mathbb{Q}$.

The author gives definitions for p-adic automorphic forms on any twisted form G of $\mathrm{GL}_n/\mathbb{Q}$ compact at infinity, and constructs the "eigenvariety" of finite slope eigenforms of wild level $\Gamma_0(p)$, at a split place p. He proves variants of Coleman's result that small slope forms are classical (Prop. 4.7.4) and of Wan's bounds for explicit radii for the families (Cor. 5.3.3). The eigenvariety should perhaps be the natural domain for the special values of p-adic L-functions.

Let us briefly describe the contents of each section.

Sections 2 and 3 summarize necessary results concerning representation theory of $\mathrm{GL}_n(\mathbb{Q}_p)$ and its Iwahori subgroup $\Gamma_0(p)$. Let $U_0(p) \subset G(\mathbb{A}_f)$ denote a compact open subgroup whose p-component is $\Gamma_0(p)$.

In section 4 the author defines the analytic family $\mathcal{S}(G, U_0(p)) = \{\mathcal{S}_t(G, U_0(p))\}_{t \in \mathcal{W}(\mathbb{C}_p)}$ of Banach spaces of p-adic automorphic forms of type $(G, U_0(p))$ and weights in $\mathcal{W}(\mathbb{C}_p) := \mathrm{Hom}_{gr-an}((\mathbb{Z}_p^\times)^n, \mathbb{C}_p^\times)$. Such a family admits an action of the global Hecke algebra. In section 5 he studies characteristic series of the U_p-operator acting on $\mathcal{S}(G, U_0(p))$. The main construction (generalizing the construction of Coleman-Mazur) is given in section 6 (Thm. 6.3.6, Prop. 6.4.2, Prop. 6.4.6). As an application, in section 7 he constructs n-dimensional p-adic families of non-ordinary, n-dimensional Galois representations coming from Shimura varieties of certain unitary groups.

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